



**ST. JOHNS RIVER STATE COLLEGE**  
**LIBRARY RENOVATION & ADDITION**  
**Bid Number: BID-SJR-03-2019**

**CONSTRUCTION DOCUMENTS – Volume I of II**



**PROJECT CONSULTANTS:**

CIVIL ENGINEERS  
**HANSON PROFESSIONAL SERVICES, INC.**  
JACKSONVILLE, FLORIDA

STRUCTURAL/MECHANICAL/ELECTRICAL/PLUMBING  
FIRE PROTECTION/COMMUNICATIONS ENGINEERS  
**TLC ENGINEERING SOLUTIONS, INC.**  
COCOA, FLORIDA

**HARVARD • JOLLY**  
ARCHITECTURE

DESIGN OFFICE: 2714 Dr. Martin Luther King Jr. Street North, St. Petersburg, Florida 33704 AAC00019  
**Date of Issue: January 2, 2020** HJ Comm. Number: 18064.00



St. Johns River State College  
Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

SECTION 00 01 07 – PROFESSIONAL SEALS PAGE

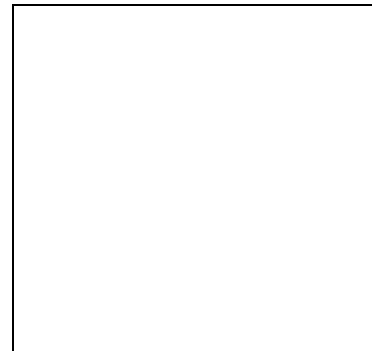
**SEALS AND SIGNATURES**

**To the best of my knowledge, these plans and specifications are complete and comply with the applicable minimum Building Codes and the applicable Fire-Safety Standards.**

1.1 DESIGN PROFESSIONALS OF RECORD

**ARCHITECT**

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St. Johns River State College  
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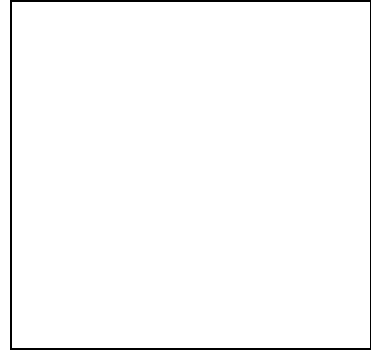
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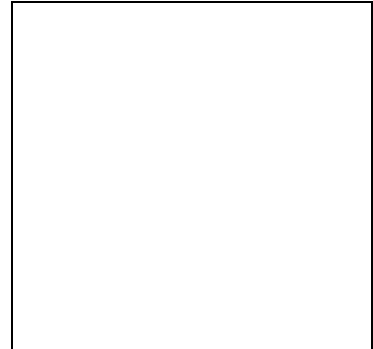
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Cocoa, Florida 32922

Company License No. 15

Division 21





St. Johns River State College  
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**PLUMBING ENGINEER**

Mike Angell, P.E.

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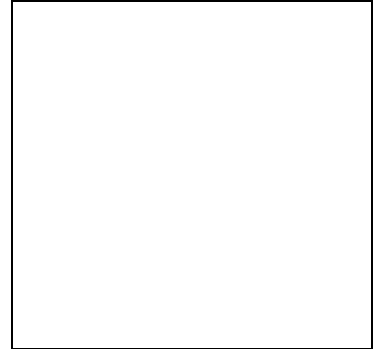
**TLC Engineering Solutions, Inc.**

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Cocoa, Florida 32922

Company License No. 15

Division 22





St. Johns River State College  
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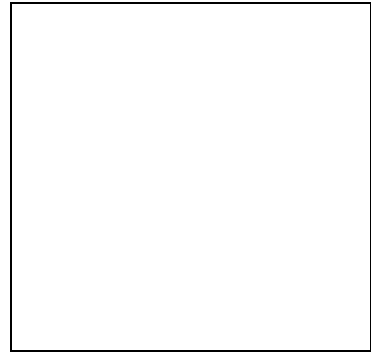
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St. Johns River State College  
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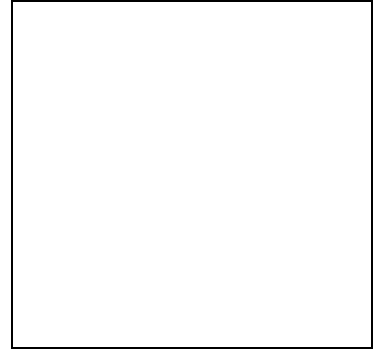
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Divisions 26





St. Johns River State College  
Library Renovation & Addition  
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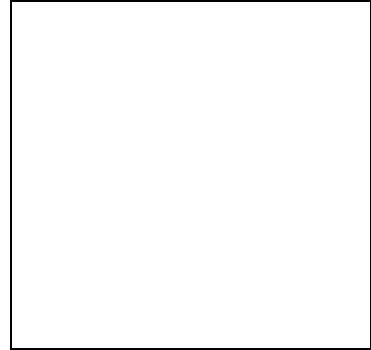
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Division 27 and 28





St. Johns River State College  
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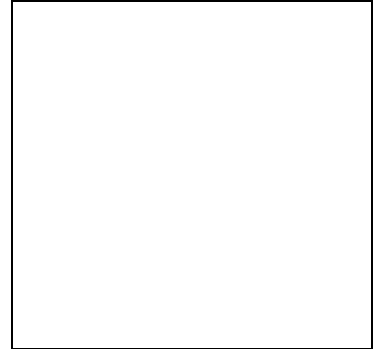
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Division 32





St. Johns River State College  
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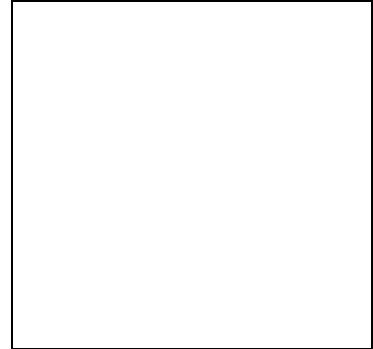
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Divisions 31 and 32







St. Johns River State College  
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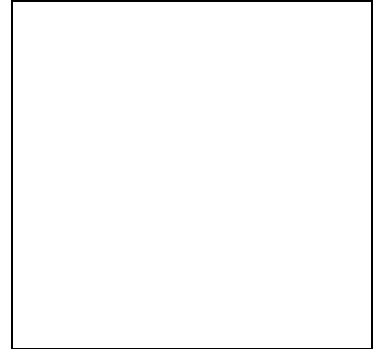
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SECTION 00 11 16 – INVITATION TO BID

1.1 INVITATION TO BIDDERS

- A. Sealed bids will be received in the business office of the **Director of Capital Contract Management at St. Johns River State College, Palatka, Florida** for the provision of the following project for SJR State College, Palatka, Florida.

**BID NO.: BID-SJR-03-2019**

**BID TITLE: LIBRARY RENOVATION AND WORKFORCE ADDITION  
ST. JOHNS RIVER STATE COLLEGE  
283 COLLEGE DRIVE  
ORANGE PARK, FL 32065**

1.2 BIDS

- A. Bids will be received at St. Johns River State College, Business Office, Attn: Beverly Barker, Director of Capital Contract Management, 5001 St. Johns Avenue, Palatka, Florida, until:

LOCAL TIME: **2:00 P.M.**  
DAY OF WEEK: **Tuesday**  
DATE: **February 4, 2020**

Bids received by the deadline for submission will be publicly opened, read aloud, and recorded at **2:30 P.M.** at **St. Johns River State College, Administration Building, Room A-154, 5001 St. Johns Avenue, Palatka, Florida 32177.**

- B. A Mandatory Pre-Bid Meeting will be held on January 7, 2020, at 2:00 P.M. at St. Johns River State College, Building A, Room A0072, 283 College Drive, Orange Park, FL 32065. Primary bidders or their representatives are required to attend in order to be eligible to bid. Attendance will be taken. Subcontractors are welcomed but attendance at the conference is only mandatory for primary bidders. Tour of the worksite will immediately follow the meeting.

- C. **This project is open to Invited, Prequalified Bidders only.** Only those bids from invited, pre-qualified contractors who attend the mandatory pre-bid meeting, and received by the submission deadline will be considered.

1.3 BIDDING DOCUMENTS

- A. An overview of bidding documents/plans will be presented at the mandatory pre-bid meeting on January 7, 2020.

- B. Bidding documents may be examined by appointment at:

HARVARD JOLLY ARCHITECTS  
2105 Park Avenue, Suite 5  
Orange Park, Florida 32073  
TEL: (904) 396-3300

Email all questions to [d.sonavadekar@harvardjolly.com](mailto:d.sonavadekar@harvardjolly.com), include project number 18064.00 in the subject line.

- C. 1. Bidding Documents, in whole, are available for purchase on January 2, 2020 and on file with the following plan rooms:
- LDI Reproprinting, 550 Wells Road, Suite 100, Orange Park, Florida 32073, (904-579-4027) [orangepark@ldireproprinting.com](mailto:orangepark@ldireproprinting.com).
  - Southside Blueprint Planroom, 1910 Huntsford Road, Jacksonville, FL 32207, (904-398-0575)
  - Builders Exchange and Reprographics, 115 Myrtle Lane, Daytona Beach, FL 32114 (386-253-7888)
  - Construction Bulletin, 400 SW 7th Street, Stuart, FL 34994 (904-388-0336)
2. Requests for billing will not be honored.

- D. Bidding Document Cost: Shipping charges are in addition to below stated amounts:

<u>ITEM</u>	<u>NON-REFUNDABLE AMOUNT / EACH</u>
Complete Set of Bidding Documents	\$325.00
Shipping Charges (per set)	Actual cost

- E. Distribution:  
Prime bidders, who will be submitting a bid to the owner, are required to register with the Owner and Harvard Jolly Architects their intention to bid and as a plan holder. Any addenda will be sent automatically (electronically) to the known plan holders. Partial sets of drawings and/or specifications are not advised and neither the architect nor owner will be responsible for partial information given to subcontractors by the general contractors. Electronic drawings and specifications will not be distributed.

- F. All questions concerning the project shall be submitted, in writing, to the Design Consultant, Harvard Jolly Architecture:

HARVARD JOLLY ARCHITECTS  
2105 Park Avenue, Suite 5  
Orange Park, Florida 32073  
TEL: (904) 396-3300

This office is the only point where information will be disseminated. All questions must be received by 5:00 p.m. on Wednesday, January 22, 2020. Final addendum will be issued Tuesday, January 28, 2020. Send all questions to Dattatraya Sonavadekar at [d.sonavadekar@harvardjolly.com](mailto:d.sonavadekar@harvardjolly.com); include project number 18064.00 in the subject line.

#### 1.4 BONDS

- A. The successful contractor is required to furnish Performance and Payment Bonds described in the Bidding Documents.

- B. Bid guarantee in the form of a Bid Bond executed by the bidder and a qualified surety or a certified or cashier's check on any national or state bank in the amount of five percent (5%) of the total proposal, including alternates, made payable to St. Johns River State College, must accompany the bidder's proposal. After opening bids, and in the event contract is awarded to the bidder, the bidder will, within ten (10) days after receiving same, execute contract and furnish the required Performance and Payment bonds, failing which the security shall become the property of St. Johns River State College as liquidated damages.

1.5 PREPARATION AND SUBMISSION OF PROPOSAL

- A. All bids must be made on Proposal Forms, included herein, properly executed and placed in an envelope, sealed, and marked on the outside:

**BID-SJR-03-2019**

St. Johns River State College  
Library Renovation and Workforce Addition  
Orange Park Campus

Deliver or mail to: **St. Johns River State College**  
**Business Office, ATTN: Beverly Barker**  
**5001 St. Johns Avenue**  
**Palatka, Florida 32177**

- B. St. Johns River State College reserves the right to reject any or all bids, to waive any informalities in regards thereto, to waive any minor deviations in an otherwise valid bid proposal, to rebid or not, to make the award in part or in whole, and to make the award which is in the best interest of the College. It is the intention of the College to award a contract to a single qualified bidder submitting the lowest total base bid and any bid alternate proposals contingent upon availability of funding. The College is not necessarily bound to accept the lowest bid if that bid is contrary to the best interest of the College.
- C. No changes in the amounts of bids appearing on the outside of bids will be considered. Only the amounts shown inside the envelope will be considered. All changes, correction and erasures must be initialed by the person signing the bid.
- D. Furnish with your bid satisfaction of your proper licensing.

END OF SECTION 00 11 16



SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS

A. BID DATE:

Sealed proposals will be received by St. Johns River State College at the date, time and place so stated in the "Invitation to Bid" Section 00 11 16 for all work herein. The bidder or his authorized representative is invited to be present at the bid opening.

B. PROJECT SITE LOCATION:

ST. JOHNS RIVER STATE COLLEGE  
283 COLLEGE DRIVE  
ORANGE PARK, FLORIDA

C. PROPOSALS:

All work on the project shall be included in the proposal for the General Construction. Proposals for bid items for this project shall be submitted *in duplicate* on the proposal form enclosed in this project manual. The proposal shall be sealed in an envelope and marked to indicate the project name, bid number and contractor's name. The envelope shall then be forwarded or delivered to Beverly Barker, Director of Capital Contract Management, in the Administration Building at St. Johns River State College, Business Office, 5001 St. Johns Avenue, Palatka, Florida 32177.

1. The bidder shall fill in their proposal completely and correctly sign the proposal. Proposals that show any omissions, alterations of the proposal, additions not authorized by the St. Johns River State College, conditional bids, or irregularities of any kind, may be rejected.
2. Proposals shall be submitted in sufficient time for receipt by St. Johns River State College, prior to the scheduled hour for receipt of the proposals. Bids received after the scheduled bid date and time will not be considered. No changes will be permitted after bids have been submitted. All bidders shall be notified of the bid results by posting on the College's web page dedicated to this bid at <http://www.sjrstate.edu/032019>.
3. No proposals may be withdrawn, after the schedule closing time for bids, for a period of sixty (60) days.

D. COMPLETION:

Time of completion for this project is a condition of the contract and as such is not flexible. The time of completion is indicated in the specifications and no extension of time is anticipated. If the bidder cannot meet the construction schedule, the bidders should not submit a bid.

E. CONTRACTOR'S LICENSE:

All bidders shall be licensed as required by the State of Florida laws.

F. SITE INVESTIGATION:

Each bidder shall, before submitting their proposal, examine the site to determine the extent of the work involved and the conditions under which they must perform the work.

The submittal of a proposal will be construed as evidence that such examination has been made and no subsequent allowance will be made in this connection.

G PERMITS, FEES AND TAXES:

Cost of social security and other applicable state and federal government taxes and any sales taxes for which the bidder is liable shall be included in his proposal for the work. No local building permits are required for work on the campus. The successful contractor will be required to obtain a permit from the College's permitting agent. The bidder should not include the cost of the permit in their proposal. The College will reimburse the successful bidder for the cost of the permit, upon submission to the Director of Capital Contract Management, a copy of the permit and the paid receipt for the permit.

H. PERFORMANCE AND PAYMENT BOND:

The successful bidder shall furnish a satisfactory performance and payment bond with a corporate surety rated "A-" or better in the current A. M. Best Guide and authorized to do business in the State of Florida, and acceptable to the College, within ten (10) days after notice of award. The bond shall be conditioned well and truly to perform the contract and pay all bills and invoices, for labor done and materials furnished in the performance of the work including guarantee period of one (1) year against faulty work, and be on AIA Document Form A312.

1. All bonds must be executed under corporate seal of the surety and countersigned on the part of the surety by a qualified resident agent of the company or an attorney in fact with proof of power attached.
2. In case of default on the part of the contractor, actions for all expenses incidental to ascertaining and collecting losses under the bond including both architectural and legal services shall lie against bond.
3. Such bond shall be in the penal sum of 100% of the contract.
4. Premiums for the performance and payment bond shall be included in the bidder's proposal.

I. BID SECURITY:

Bid guarantee in the form of a Bid Bond executed by the bidder and a qualified surety or a certified or cashier's check on any national or state bank in the amount of five percent (5%) of the total proposal, including alternates, made payable to St. Johns River State College, must accompany the bidder's proposal. After opening bids, and in the event contract is awarded to the bidder, the bidder will, within ten (10) days after receiving same, execute contract and furnish the required Performance and Payment bonds, failing which the security shall become the property of St. Johns River State College as liquidated damages.

J. INTERPRETATION OF DRAWINGS AND SPECIFICATIONS:

Should a bidder find discrepancies or ambiguities in, or omissions, from the drawings and specifications, or should he be in doubt as to their meaning, the bidder shall at once notify the Architect for an interpretation in the form of an addendum. Addendum will be forwarded to all bidders and each bidder shall acknowledge the receipt of each addendum on his proposal in the spaces provided. Bidders should address all inquiries in written form for this project to:

HARVARD JOLLY ARCHITECTS  
105 Park Avenue, Suite 5  
Orange Park, Florida 32073  
TEL: (904) 396-3300

This office is the only point where information will be disseminated. All questions must be received by 5:00 p.m. on Wednesday, January 22, 2020. Final addendum will be issued Tuesday, January 28, 2020. Send all questions to Dattatraya Sonavadekar at [d.sonavadekar@harvardjolly.com](mailto:d.sonavadekar@harvardjolly.com); include project number 18064.00 in the subject line.

K. STANDARD BASIS FOR BIDDING:

1. Equality: Where materials, etc., are referred to in the specifications as "equivalent to" or words of similar import, the Architect shall decide as to equality. In addition to data required under paragraph "Shop Drawings" and "Manufacturer's Description Data", the contractor shall furnish other detailed data as required by the Architect for comparison if the product is mentioned by name. All data shall be submitted at least ten (10) days prior to the scheduled bid opening date. No extra will be allowed because of such substitution, if permitted, either for the article substituted or for revisions in other work affected by the substitution. If permitted, all plan holders will be notified by addendum.
2. Substitutions: Where a particular system, product or material is specified by one or more trade names without the "equivalent" qualification, it shall be considered as a standard basis for bidding, and is most satisfactory for its particular purpose in the work. To insure a uniform basis for bidding, the bidder shall base its proposal on the particular system, product or material named in the specifications.
3. Any proposal submitted that does not conform to the above requirements shall be considered as informal and unfair to other bidder's submitted proposals, and will not be accepted.
4. No changes in the amount of bid appearing on the outside of the bid envelope will be considered. Only the amount shown inside the envelope will be considered. All changes, corrections and erasures must be initially by the person signing the bid.
5. Subcontractors and Shop Fabricators:
  - a. Bidders shall furnish with their bids the names and the class of work to be performed by fabricators when the amount to be paid each subcontractor exceeds 5% of the total price.
  - b. The successful bidder shall employ the subcontractors listed in the bidder's proposal along with the class of work to be performed by each. This list shall not be modified in any way whatsoever without the written consent of the College in writing to ensure those subcontractors shall be utilized for the specified class of work.
  - c. Modifications to the listed subcontractors may be granted by the College only in those instances where the bidder presents written evidence that use of the listed subcontractor would not be in the best interest of the College.

L. EQUIVALENTS:

1. In these specifications where one certain kind, type or brand of material manufacturer is named, it shall be regarded as the required minimum standard of quality. Substitutions lowering the performance, quality, method of assembly or installation, or in general, not in keeping with the details and specifications will not be permitted. It is understood that when a bid is submitted, the bidder is aware of the requirements, and that the materials within his bid are equal to or better on such items and that prior approval of substitutions has been obtained.
2. No time extensions will be permitted, to revise or redesign a product found not to comply, and that evidence of noncompliance shall automatically classify the bid as having been informal and rejected.

3. Since time is of the essence, the College cannot be expected to delay the award of bid, and their decisions shall be in strict accordance to the details and specifications, these items should be brought to the attention of the Architect of the project and of the College prior to submitting a bid proposal.

M. DISQUALIFICATION OF BIDDERS:

1. Only one proposal from an individual, firm, partnership, or corporation, under the same or different names will be considered.
2. Should there be any reasonable grounds for the College, believing that a collusion or combination exists between bidders, all proposals may be rejected and all such bidders or participants in such combination or collusion will not be considered in the future proposal for the same work.
3. No proposal or bid will be considered unless accompanied by a proposal guarantee or good faith deposit in the amount in the form specified in the Invitation to Bid.
4. Proposals that are incomplete or not signed by the bidder may be rejected.
5. Proposals that are submitted without the sub-bidders listing completed as required and indicated the specifications may be rejected.

N. RETURN OF PROPOSAL GUARANTEES:

Proposal guarantees by certified or cashier's check will be returned to the bidder immediately after the tabulation and analysis of the bids, except in the event that it pertains the three (3) lowest bidders; these will be returned within fifteen (15) days following award of the contract.

O. CONTRACT AWARD:

It is the intention of the College to award a contract to a single qualified bidder submitting the lowest proposal for the work in compliance with the bid specifications/plans, total base bid and any bid alternate proposals, contingent upon availability of funding. The College is not necessarily bound to accept the lowest bid if that bid is contrary to the best interest of the College. St. Johns River State College reserves the right to reject any or all bids, to waive any informalities in regards thereto, to waive any minor deviations in an otherwise valid bid proposal, to rebid or not, to make the award in part or in whole, and to make the award which is in the best interest of the College. The College reserves the right to negotiate with the low bidder on any changes which the Board considers necessary for its interest, including but not limited to direct purchase of materials.

P. EXECUTION OF CONTRACT:

1. Within the (10) days after Notice of Award, the successful bidder shall enter into a formal contract. The contractor will provide a guarantee period of one (1) year against faulty work and be on the form as provided by the College.
2. Failure to execute the contract as provided in these documents within ten (10) days from the date of the notification of award shall be just cause and the College may annul and void the award and declare forfeiture of the proposal guarantee or good faith deposit in liquidation of all damages sustained.
  - a. Award may then be made to the next lowest responsible bidder, or the work may be re-advertised.
3. No award will be binding upon the College until the construction contract has been executed.



4. The construction contract shall be signed in triplicate by the College and the Contractor.

**Q. BID PROTESTS**

Bid protests shall be served on Dr. Lynn Powers, Vice President for Finance and Administration/CFO, and Beverly Barker, Director of Capital Contract Management, 5001 St. Johns Avenue, Palatka, Florida 32177, via certified mail. Bid protests may be preliminarily filed, if followed by a certified mail original, via facsimile transmittal to Dr. Lynn Powers and Beverly Barker at 386/312-4229. Bid protests must be accompanied by a cost deposit of five thousand dollars (\$5,000.00) or one percent of the total contract price, whichever is greater. Failure to file a notice of protest, failure to file a formal written protest, or failure to post the bond or other security shall constitute a waiver of proceeding. The formal written protest shall state with particularity the facts and law upon which the protest is based.

Failure to file a notice of protest or failure to file a formal written protest within the time prescribed in section 120.57 Florida statues, or failure to post the bond or other security required by law within the time allowed for filing a bond shall constitute a waiver of proceedings. Furthermore, the unsuccessful protester shall be responsible to the College for all other and additional reasonable fees, expenses and costs, in the event the deposit which the College retains pursuant to this paragraph is insufficient to reimburse the College for all costs and fees incurred.

END OF SECTION 00 21 13



## SECTION 00 22 13 – SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

### **Supplemental Instructions to Bidders**

All items in this section are incorporated into the contract terms and conditions.

### **Liquidated Damages**

**The Bidder agrees that liquidated damages in the amount of *One Thousand Dollars (\$1,000.00) per calendar day* for each day the work remains incomplete, shall be assessed against the Bidder if the work is not completed within the specified time limit. It shall be understood that liquidated damages are not a penalty, but are intended to provide a means of recovery of actual damages suffered by the Owner as a result of delayed completion.**

### **Contract Time**

**Contract time to Substantial Completion is three hundred thirty-five (335) Calendar Days.**

### **Definitions**

The College, SJR State, or St. Johns River State College, refers to the District Board of Trustees of St. Johns River State College, Palatka, Florida. The College is a political subdivision of the State of Florida. Firm, vendor, contractor or bidder in this document refers to respondents to this invitation to bid.

### **Taxes**

The College does not pay federal, excise, or state sales taxes.

The applicable tax-exemption number is: Florida Sales Tax: 85-8013170533C-4

### **Mandatory Pre-Bid Conference**

Attendance at the Mandatory Pre-Bid Conference is a requirement for primary prequalified contractors in order to be eligible to bid on this project.

### **Bidding Costs**

St. Johns River State College is not responsible for any cost incurred by bidders in their efforts in submitting this bid.

### **Bid Bond**

Bid guarantee in the form of a Bid Bond executed by the bidders and a qualified surety, or a certified or cashier's check on national or state bank in the amount of five percent (5%) of the proposal, including alternates, made payable to St. Johns River State College, must accompany the proposal.

### **Open Competition**

The College encourages free and open competition among Pre-Qualified Firms. Whenever possible, specifications, bid invitations, and conditions are designed to accomplish this objective, consistent with the necessity to satisfy the College's needs and the accomplishment of a sound economical operation. The Firm's signature on the Bid Checklist/Response Form guarantees that the Firm, its agents, officers, or employees have not been bribed or attempted to bribe or influence in any way an officer, employee or Agent of the College.

### **Minority & Women Owned Business Enterprises (M/WBE) Participation**

M/WBE participation is encouraged.

### **Insurance Coverage**

Contractor shall obtain, maintain, and pay for insurance in the categories listed in the insurance schedule. The insurance coverage in each category shall meet or exceed the minimum limits set forth in the insurance schedule. St. Johns River State college shall be included as additional named insured on each policy. The insurance shall cover the Firm's entire operations under Agreement with the College and shall be effective throughout the effective period of this Agreement. It is not the intent of this schedule to limit the types of insurance otherwise required by this Agreement or that the Firm may desire to obtain.

### **Minimum Insurance Requirement Schedule**

Refer to 00 73 00 Supplementary Conditions for All Insurance Requirements.

### **Bid Award Process**

The bid award shall be made to the lowest and best proposal, Base and Alternates within budget, which meets or exceeds the conditions of the bid specifications and the College reserves the right to award by individual item, groups of items, "All or None" or a combination thereof contingent upon budget availability. The College is not necessarily bound to accept the lowest bid if that bid is contrary to the best interests of the College. St. Johns River State College reserves the right to waive any minor deviations in otherwise valid bid proposal, to waive any informalities, to reject any or all bid proposals, and to accept the bid which will be in the best interest of SJR State. In addition, the College shall have the right to reject any bid not accompanied by data required by the bid specifications, or a proposal in any way incomplete or irregular. Conditional bids will not be accepted. Should the lowest Bidder exceed the proposal budget of the Owner, the Owner may negotiate with the Bidder in order to obtain a bid within budget, including but not limited to College direct purchase of materials.

### **Bid Rejection**

The College shall have the right to reject any or all bids and in particular to reject a bid not accompanied by data required by the bid specifications or a proposal in any way incomplete or irregular. Conditional bids will not be accepted.

### **Bid Specification Interpretation**

Interpretation of the wording of this document shall be the responsibility of the College and that interpretation shall be final.

### **Bid Response Materials**

The materials submitted in response to this invitation to bid becomes the property of the College upon delivery to the Office of the Director of Capital Contract Management and may be appended to any formal document which would further define or expand the contractual relationship between the College and the successful bidder.

### **Errors and Omissions**

The successful bidder is expected to comply with the true intent of these bid specifications taken as a whole and shall not avail itself of any errors or omissions to the detriment of the services. Should successful bidder suspect any error, omission or discrepancy in the bid documents or instructions, the successful bidder shall immediately notify the College, in writing, and the College shall issue written instructions to be followed. The successful bidder is responsible for the contents of its proposal and for satisfying the requirements set forth in the bid documents.

**Bidder Responsibility**

It is understood, and the bidder hereby agrees, that it shall be solely responsible for all services that it proposes, notwithstanding the detail present in the bid specifications.

**Cone of Silence**

SJR State employees, with the exception of the Director of Capital Contract Management, and members of the District Board of Trustees are not to be contacted regarding this bid, either directly or indirectly, except as prescribed in section 120.57, Florida Statutes, to discuss the bid or selection process or in an attempt to further their interest in being selected for bid award. Violation of this cone of silence may result in disqualification of the firm seeking recertification.

**Public Records**

To the extent that CONTRACTOR meets the definition of “contractor” under Section 119.0701, Florida Statutes, in addition to other contract requirements provided by law, CONTRACTOR must comply with public records laws, including the following provisions of Section 119.0701, Florida Statutes: Keep and maintain public records required by COLLEGE to perform the service.

Upon request from COLLEGE’s custodian of public records, provide COLLEGE with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in chapter 119, F.S., or as otherwise provided by law. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the CONTRACTOR does not transfer their records to COLLEGE.

Upon completion of the contract, transfer, at no cost, to COLLEGE all public records in possession of the CONTRACTOR or keep and maintain public records required by COLLEGE to perform the service. If the CONTRACTOR transfers all public records to COLLEGE upon completion of the contract, the CONTRACTOR shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the CONTRACTOR keeps and maintains public records upon completion of the contract, the CONTRACTOR shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to COLLEGE, upon request from COLLEGE’s custodian of public records, in a form that is compatible with the information technology systems of COLLEGE. IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR’S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS MELISSA MILLER 5001 ST. JOHNS AVE, PALATKA, FL 32177 [MELISSAMILLER@SJRSTATE.EDU](mailto:MELISSAMILLER@SJRSTATE.EDU) (386) 312-4106.

THE CONTRACTOR ACKNOWLEDGES THAT SJR STATE CANNOT AND WILL NOT PROVIDE LEGAL ADVICE OR BUSINESS ADVICE TO CONTRACTOR WITH RESPECT TO ITS OBLIGATIONS PURSUANT TO THIS SECTION RELATED TO PUBLIC RECORDS. THE CONTRACTOR FURTHER ACKNOWLEDGES THAT IT WILL NOT RELY ON SJR STATE OR ITS COUNSEL TO PROVIDE SUCH BUSINESS OR LEGAL ADVICE, AND THAT HE HAS BEEN ADVISED TO SEEK PROFESSIONAL ADVICE WITH REGARDS TO PUBLIC RECORDS MATTERS ADDRESSED BY THIS AGREEMENT. THE CONTRACTOR ACKNOWLEDGES THAT ITS FAILURE TO COMPLY WITH FLORIDA LAW AND THIS AGREEMENT WITH RESPECT TO PUBLIC RECORDS SHALL CONSTITUTE MATERIAL BREACH OF THIS AGREEMENT AND GROUNDS FOR TERMINATION.

**Sovereign Immunity**

St. Johns River State College is a political subdivision of the State of Florida. As such, the College is entitled to sovereign immunity except to the extent of the waiver set forth in 768.28 F.S., the College's performance under any resulting agreement and any amendments there to or attachments connected there with, shall at all times be subject to any and all state laws, state regulations and College District Board of Trustees which are applicable to the College's operations, commitments and/or activities in furtherance of any terms specified therein.

**Severability**

If any provisions of the agreement resulting from this bid are contrary to, prohibited by, or deemed invalid by applicable laws or regulations of any jurisdiction in which it is sought to be enforced, then said provisions shall be deemed inapplicable and omitted and shall not invalidate the remaining provisions of the agreement. In the event any provision of this agreement shall be held invalid or unenforceable by a court of competent jurisdiction, or by an administrative hearing officer in accordance with Chapter 120, Florida Statutes, such holding shall not invalidate or render unenforceable any other provision hereof.

**Venue**

The contract, when entered into and any disputes hereunder, shall be construed in accordance with the laws of the State of Florida and enforced in the courts of the State of Florida. College and Firm hereby agree that venue shall be in Putnam County, Florida.

**Americans with Disabilities Act of 1990**

If special accommodations are required in order to attend the Public Meeting to announce bids received, contact the Director of Capital Contract Management at 386-312-4110 or email [BeverlyBarker@sjrstate.edu](mailto:BeverlyBarker@sjrstate.edu) a minimum of three business days prior to the meeting.

**Protests of Awards or Specifications**

Failure to file a notice of protest or failure to file a formal written protest within the time prescribed in section 120.57 Florida statutes, or failure to post the bond or other security required by law within the time allowed for filing a bond shall constitute a waiver of proceedings.

**Independent Firm**

Nothing herein is intended or shall be construed in any way creating or establishing the relation of co-partners between the parties or in any way making the Firm the agent or representative of the College for any purposes in any manner whatsoever. Firm is, and shall remain, an independent Firm with respect to all services performed.

**Laws, Ordinances, Rules, Regulations, Permits, and Licenses**

The Firm shall observe and obey all laws, ordinances, rules, regulation, and policies of the District Board of Trustees of St. Johns River State College and the federal and state governments which may be applicable to the Firm's operation at St. Johns River State College, and shall, at the sole cost to the Firm, obtain and maintain all permits and licenses necessary to comply with such requirements and standards.

**Bid Response Authorization**

The bid response shall be signed by a person legally authorized to bind the Firm.

**Firm Warranty of Ability to Perform**

Firm shall warrant by authorized signature on the bid response that there is no action suit, proceeding, inquiry, or investigation, at law or equity, before or by a court, governmental agency, public board or body, pending or, to the best of the Firm's knowledge, threatened, which would in any way prohibit, restrain, or enjoin the execution or delivery of the Firm's obligations, diminish the Firm's obligations or diminish the Firm's financial ability to perform the terms of the proposed contract.

**Contract**

The successful bidder will enter into a contract with the College based on bid documents and the result of the bid award within the time prescribed for contract execution.

**Assignment**

Neither this agreement nor any duties or obligations under this agreement or resulting contract(s) shall be assigned by Firm without prior written consent of the College.

**Indemnification**

The firm shall indemnify and hold harmless the College, and any agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, but only to the extent caused in whole or in part by negligent acts or omissions of the Firm or anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense, is caused in part by a party indemnified hereunder. Such obligations shall not be considered to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist.

**Payment**

When the Contractor receives payment from the Owner for labor, services, or materials furnished by subcontractors and suppliers hired by the Contractor for the project, the Contractor shall remit payment due to those subcontractors and suppliers, less the value of any items contested in accordance with the Contract, within 10 days after the Contractor's receipt of payment from the Owner. When the payment due the subcontractor is for final payment, including retainage, the subcontractor must include with the invoice for final payment a conditional release of lien and all appropriate warranties and closeout documentation. When the subcontractor receives payment from the Contractor for labor, services, or materials furnished by subcontractors and suppliers hired by the subcontractor, the subcontractor shall remit payment due to those subcontractors, less the value of any item contested in accordance with the contract, within ten (10) days after the subcontractor's receipt of payment.

**INSTRUCTIONS FOR SUBMISSION OF BIDS**

Sealed bids will be accepted in the office of the Director of Capital Contract Management, St. Johns River State College, Business Office, 5001 St. Johns Avenue, Palatka, FL 32177 until 2:00 PM EST on February 4, 2019. The bid submission must be sealed and clearly marked 'BID SJR-03-2019' on the outside of the package containing the bid response. Bids received after that time and date will be marked late and will not be considered. It is the sole responsibility of the bidder to ensure that the bid is delivered to the Office of the Director of Capital Contract Management in the Business Office of St. Johns River State College, 5001 St. Johns Avenue, Palatka, Florida prior to the deadline. Failure of a delivery service or US mail to deliver bid responses by the

St. Johns River State College  
Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

due date and time shall not constitute an extension to the deadline. Faxed, e-mailed, conditional, improperly identified submissions, bids delivered to the wrong location, and bids received after the deadline will not be considered.

**Submit one original (marked as Original) and one copy (marked as Copy) of your bid response. The bid response must include a signed Bid Checklist/Response Form and each document indicated on this form. All documents should be bound or stapled to the Bid Checklist/Response Form. Failure to submit a bid on the required form shall be grounds for disqualification of the bid.**

END OF SECTION 00 22 13



St. Johns River State College  
Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

SECTION 00 22 18 – TRENCH SAFETY CERTIFICATION

Provide price for trench safety for trench excavations in excess of five (5) feet deep in accordance with the Trench Safety Act, Chapters 90-96, Laws of Florida and OSHA Standard 29 C.F.R. s. 1926.650, Subpart P. The Bidder by execution of this Bid Proposal certifies that he will comply fully with the above said Trench Safety Act and OSHA Safety and Health Standards.

The Contractor herein verifies that he is aware of the Trench Safety Act and has in his/her bid all costs related to the requirement of this Act.

---

Certified by Contractor



SECTION 00 25 13 – MANDATORY PRE-BID MEETING AND SITE VISIT

PART 1 – GENERAL

1.1 SUMMARY

- A. Prime Bidders (Invited, Pre-Qualified Contractors) must attend the **MANDATORY PRE-BID MEETING** described in the Invitation to Bid (Section 00 11 16).
- B. Attendance is mandatory for Pre-Qualified Prime Bidders. Sub-contractors are invited and encouraged to attend the Mandatory Pre-Bid Conference, but attendance is only mandatory for prime bidders.
- C. Agenda Outline: Prepared by Architect
  1. Public Meeting Call to Order (Director of Capital Contract Management-(DCCM))
  2. Welcome and Opening Remarks (DCCM)
  3. Attendance roster to be signed by all attendees (DCCM, Et All.)
  4. Introduction of Owner (SJR State) Project Team Attendees (DCCM)
  5. Introduction of Architect/Engineer & Project Team and Attendees (HJA)
  6. Project Summary and Scope of Work (HJA & Owner)
  7. Availability of Documents (HJA)
    - a. Plan Rooms
    - b. General Contractors
    - c. Sub-Trade Plan Availability
    - d. Set Purchases (full)
  8. Instructions to Bidders and Review of Bid Process (DCCM)
  9. Contractual Agreement (DCCM)
  10. Proposal Submission Requirements & List(s) of Subcontractors (DCCM)
  11. Products and Substitutions (HJA)
  12. Addenda Schedule (HJA)
  13. Contractor Question Period (answers will be included in an addendum) (HJA & Owner)
  14. Closing Statements (HJA & Owner)
  15. Pubic Meeting Adjournment (DCCM)
  16. Site Visit (All)

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION

3.1 AGENDA

- A. Copies of this agenda will be available to all parties in attendance.

END OF SECTION 00 25 13



SECTION 00 31 13 – PROJECT SCHEDULE

- Bid Documents/Plans Available to Pre-Qualified General Contractors
  - Date: January 2<sup>nd</sup>, 2020
- **Mandatory Pre-Bid Conference**
  - Date: January 7, 2020
  - Time: 2:00 P.M.
  - Location: Orange Park Campus
    - St. Johns River State College, Building A, Room A0072, 283 College Drive, Orange Park, FL 32065
- **Deadline for Bid Submission**
  - Date: February 4, 2020
  - Time: 2:00 P.M.
  - Location: Palatka Campus
    - Sealed bids, bearing on the outside of the envelope the name of the contractor and '**BID-SJR-03-2019**', must be received in the **St. Johns River State College, Business Office, Attention: Beverly Barker, 5001 St. Johns Avenue, Palatka, FL 32177**
- Public Meeting to Verbally Announce Bids Received (Bid Opening)
  - Date: February 4, 2020
  - Time: 2:30 P.M.
  - Location: Palatka Campus
    - St. Johns River State College, **Room A-154**, 5001 St. Johns Avenue, Palatka, FL 32177
- Electronic Posting of Bid Results & Notice of Intent to Award
  - Date: February 5, 2020 at <http://www.sjrstate.edu/032019>
- Award of Bid by SJR STATE COLLEGE
  - Date: February 19, 2020
  - Location: DBOT Meeting St. Augustine Campus
    - St. Johns River State College, 2990 College Drive, St. Augustine, FL 32084
- Electronic Posting of Bid Award
  - Date: February 20, 2020 at <http://www.sjrstate.edu/032019>
- Notice to Proceed Issued:
  - Upon receipt of Executed Contract, Bonds, Certificate of Insurance, & Permit
    - Pre-Construction Meeting
  - Date/Time/Location: **TBD**

St. Johns River State College  
Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

- Construction Start
  - Upon Notice to Proceed Issued
- Substantial Completion
  - 335 Calendar Days from Notice to Proceed Date
- Final Completion
  - 30 Days after Substantial Completion

END OF SECTION 00 31 13

SECTION 00 31 26 – EXISTING HAZARDOUS MATERIAL INFORMATION

1.1 EXISTING HAZARDOUS MATERIAL INFORMATION

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. An existing asbestos report for *Limited Renovation Asbestos Survey Report*, St. Johns River State College – Orange Park Campus, prepared by GLE Associates, Inc., dated August 5, 2019, is available for viewing at the office of Architect.

END OF SECTION 00 31 26





# **LIMITED RENOVATION ASBESTOS SURVEY REPORT**

**St. Johns River State College  
Orange Park Campus  
Building L – Learning Resource Center  
285 College Drive  
Orange Park, Florida**

**GLE Project No.: 19000-21328**

**Prepared for:**

**Mr. Mike Canaday  
St. Johns River State College  
5001 St. Johns Avenue  
Palatka, Florida 32177**

**August 2019**

**Prepared by:**



**8659 Baypine Road, Suite 306  
Jacksonville, Florida 32256  
904-296-1880 • Fax 904-296-1860**



August 5, 2019

Mr. Mike Canaday  
Directory of Facilities  
St. Johns River State College  
5001 St. Johns Avenue  
Palatka, Florida 32177

**RE: Limited Renovation Asbestos Survey Report  
St. Johns River State College - Orange Park Campus  
Building L – Learning Resource Center  
285 College Drive  
Orange Park, Florida**

GLE Project No.: 19000-21328

Dear Mr. Canaday:

GLE Associates, Inc. (GLE) performed a limited Renovation Survey for asbestos-containing materials (ACM) on July 30, 2019, at St. Johns River State College – Orange Park Campus Building L, located in Orange Park, Florida. The survey was performed by Mr. Erik Kinard with GLE. This report outlines the sampling and testing procedures, and presents the results along with our conclusions and recommendations.

GLE appreciates the opportunity to serve as your consultant on this project. If you should have any questions, or if we can be of further service, please do not hesitate to call.

Sincerely,  
**GLE Associates, Inc.**

Erik Kinard  
Project Manager

Robert B. Greene, PE, PG, CIH, LEED AP  
President  
Florida LAC# EA 0000009

EK/MBC/RBG/lr

M:\Work\Asb\19000\21328-St Johns River State College Building L - Learning Resource Center\Report\SurveyReport.doc

GLE Associates, Inc.

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# 1.0 INTRODUCTION

## 1.1 INTRODUCTION

The purpose of this Limited Renovation Survey was to identify accessible asbestos-containing materials (ACMs) and their general locations within St. Johns River State College – Orange Park Campus - Building L, located at 285 College Drive in Orange Park, Florida. The scope of this survey was limited to interior portions of the Building. The survey was conducted pursuant to National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR 61) requirements, associated with the scheduled Renovation plans. The survey was performed on July 30, 2019, by Mr. Erik Kinard, an Environmental Protection Agency/Asbestos Hazard Emergency Response Act (EPA/AHERA) accredited inspector. The scope of this survey did not include demolition of any building components, evaluation of architectural plans, or the quantification of materials for abatement purposes, or removal cost estimating.

## 1.2 FACILITY DESCRIPTION

A summary of the facility investigated is outlined in the table below.

Facility Type:	School Facility Media Center
Construction Date:	1988
Number of Floors:	1
<b>Exterior</b>	
Floor Support:	Concrete Slab on Grade
Wall Support:	Concrete Block (CMU), Metal Framing
Exterior Finish:	Not In Scope
Roof System Type:	Not in Scope
<b>Interior</b>	
Wall Substrate:	Drywall and Joint Compound
Wall Finishes:	Paint, Cove Base
Floor Finishes:	Vinyl Floor Tile, Ceramic Tile, Carpet, Vinyl Sheet Flooring
Ceiling System:	Drywall and Joint Compound, Suspended Ceiling System
Ceiling Finishes:	Paint, Suspended Ceiling Tiles

## 2.0 RESULTS

### 2.1 ASBESTOS SURVEY PROCEDURES

The survey was performed by visually observing accessible areas within the scope of work. An EPA/AHERA accredited inspector performed the visual observations (refer to Appendix B for personnel qualifications).

After the overall visual survey was completed, representative sampling areas were determined. The surveyor delineated homogeneous areas of suspect materials and samples of each material were obtained, in general accordance with regulations as established by the Occupational Safety and Health Administration (OSHA) and NESHAP. The field surveyor determined sample locations based on previous experience. Both friable and non-friable materials were sampled. A friable material is one that can be crushed when dry by normal hand pressure. This survey did not include the demolition of building components to access suspect material.

After completion of the fieldwork, the samples were delivered to GLE's in-house National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory for analysis. The samples were analyzed by Polarized Light Microscopy (PLM) coupled with dispersion staining, in general accordance with EPA-600/R-93/116. Utilizing this procedure, the various asbestos minerals (chrysotile, amosite, crocidolite, actinolite, tremolite, and anthophyllite) can be determined. The percentages of asbestos minerals in the samples were visually determined by the microscopist. Please note that the EPA designates all materials containing greater than one percent asbestos as an "asbestos-containing material" (ACM).

Regulated Asbestos-Containing Material (RACM) is defined as (a) Friable asbestos materials, (b) Category I non-friable ACM that has become friable, (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations regulated by this subpart.

Category I and Category II non-friable ACM, as defined by the EPA:

- Category I non-friable ACM means asbestos-containing packings, gaskets, resilient floor covering, asphalt roofing products, and pliable sealants and mastics that are in good condition and not friable, containing more than one percent asbestos, as determined using the method specified in Appendix E, Subpart E, 40 CFR Part 763, Section 1, PLM.
- Category II non-friable ACM means any material, excluding Category I non-friable ACM, containing more than one percent asbestos as determined using the methods specified in Appendix E, Subpart E, 40 CFR Part 763 Section 1, PLM that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

## **2.2 IDENTIFIED SUSPECT ASBESTOS-CONTAINING MATERIALS**

A total of 57 samples of suspect building materials were collected from the facility during the survey, representing 19 different identified homogeneous areas. The results of the laboratory analyses are included in Appendix A, and approximate sample locations are indicated on the Asbestos Sample Location Plan in Appendix C. A summary of the homogenous sampling areas of suspect ACM determined to be present is outlined in the following table.

**TABLE 2.2-1: SUMMARY OF HOMOGENEOUS SAMPLING AREAS  
ST. JOHNS RIVER STATE COLLEGE – ORANGE PARK CAMPUS  
BUILDING L – LEARNING RESOURCE CENTER**

HA #	HOMOGENEOUS MATERIAL DESCRIPTION	HOMOGENEOUS MATERIAL LOCATION	FRIABILITY (F/NF)	% ASBESTOS*	# OF SAMPLES COLLECTED	APPROXIMATE QUANTITY	ACM CATEGORY
CT-01	2'x2' White Smooth Texture Ceiling Tile	Throughout	F	ND	3	NIS	NA
DW-01	Drywall and Joint Compound	Throughout	NF	ND	3	NIS	NA
VB-01	4" Gray Vinyl Cove Base with Yellow Mastic	L100 & L101	NF	ND	3	NIS	NA
CT-02	2'x2' White Wormhole Ceiling Tile	L128 & L129	F	ND	3	NIS	NA
M-01	Grout associated with Ceramic Tile	L128 & L129	NF	ND	3	NIS	NA
FT-01	12" Light Blue Floor Tile with Yellow Mastic	L108 & L118	NF	ND	3	NIS	NA
VB-02	4" Blue Vinyl Cove Base with Tan Mastic	L108 & L122	NF	ND	3	NIS	NA
FT-02	12" White with Gray Spec Floor Tile with Tan Mastic	L124 & L127	NF	ND	3	NIS	NA
CT-03	2'x4' White Fissure Ceiling Tile	L127	F	ND	3	NIS	NA
VB-03	6" Black Vinyl Cove Base with Tan Mastic	L113 & L114	NF	ND	3	NIS	NA
MSV-01	Gray Vinyl Sheet Flooring with Tan Mastic	L113 Closet and L127 beneath Floor Tile	NF	ND	3	NIS	NA
VB-04	4" Black Vinyl Cove Base with Tan Mastic	L113 Closet and L127 rear	NF	ND	3	NIS	NA
FT-03	12" White with Blue Streak and Gray Pattern Floor Tile with Tan Mastic	L122	NF	ND	3	NIS	NA
M-02	Gray Sink Undercoat	L122	NF	ND	3	NIS	NA
M-03	Gray Grout associated with Red Ceramic Tile	L100 & L101 beneath carpet	NF	ND	3	NIS	NA
MAS-01	White Duct Mastic	Throughout Plenum	NF	ND	3	NIS	NA

<b>ASBESTOS CONTENT</b> Expressed as percent	* = The facility owner has the option of point-counting by Polarized Light Microscopy (PLM) those RACM whose asbestos content is less than 10% in order to more accurately determine the asbestos content therein.						
	PC = Results based on Point-Count analysis			TEM NOB = Transmission Electron Microscopy of Non-Friable Organically Bound Material			
<b>FRIABILITY</b>	F = Friable Material		NF = Non-Friable Material				
<b>ACM CATEGORY</b>	RACM = Regulated ACM		CAT I = Category I non-friable ACM		CAT II = Category II non-friable ACM		
<b>ABBREVIATIONS:</b>	NA = Not Applicable		ND = None Detected		NIS = Not in Scope		C = Chrysotile
	A = Amosite		HA = Homogeneous Area		SF = Square Feet		LF = Linear Feet
							CF = Cubic Feet

**TABLE 2.2-1: SUMMARY OF HOMOGENEOUS SAMPLING AREAS  
ST. JOHNS RIVER STATE COLLEGE – ORANGE PARK CAMPUS  
BUILDING L – LEARNING RESOURCE CENTER**

<b>HA #</b>	<b>HOMOGENEOUS MATERIAL DESCRIPTION</b>	<b>HOMOGENEOUS MATERIAL LOCATION</b>	<b>FRIABILITY (F/NF)</b>	<b>% ASBESTOS*</b>	<b># OF SAMPLES COLLECTED</b>	<b>APPROXIMATE QUANTITY</b>	<b>ACM CATEGORY</b>
FP-01	Tan Fireproofing	Throughout Plenum on Deck and Beams	F	ND	3	NIS	NA
MAS-02	White Mastic on Foamglass Lines	L126	NF	ND	3	NIS	NA
MAS-03	White Mastic within Foamglass Lines	L126	NF	ND	3	NIS	NA

<b>ASBESTOS CONTENT</b> Expressed as percent	* = The facility owner has the option of point-counting by Polarized Light Microscopy (PLM) those RACM whose asbestos content is less than 10% in order to more accurately determine the asbestos content therein.						
	PC = Results based on Point-Count analysis			TEM NOB = Transmission Electron Microscopy of Non-Friable Organically Bound Material			
<b>FRIABILITY</b>	F = Friable Material		NF = Non-Friable Material				
<b>ACM CATEGORY</b>	RACM = Regulated ACM		CAT I = Category I non-friable ACM		CAT II = Category II non-friable ACM		
<b>ABBREVIATIONS:</b>	NA = Not Applicable		ND = None Detected		NIS = Not in Scope		C = Chrysotile
	HA = Homogeneous Area		SF = Square Feet		LF = Linear Feet		CF = Cubic Feet
A = Amosite							



### **3.0 CONCLUSIONS AND RECOMMENDATIONS**

**No asbestos-containing materials were identified in the scope of this survey.**

### **4.0 LIMITATIONS AND CONDITIONS**

As a result of previous renovations, there may be hidden materials, such as floor tile, sheet vinyl flooring, insulation, etc. These materials may be found in various areas hidden under existing flooring materials or in wall cavities. Any materials found during construction activities, either not addressed in this survey report, or similar to the ACM identified in this survey report should be assumed to be ACM until sampling and analysis documents otherwise.

Because of the hidden nature of many building components (i.e. within mechanical chases), it may be impossible to determine if all of the suspect building materials have been located and subsequently tested. Destructive testing in some instances is not a viable option. We cannot, therefore, guarantee that all potential ACM has been located. For the same reasons, estimates of quantities and/or conditions are subject to readily apparent situations, and our findings reflect this condition. We do warrant, however, that the investigations and methodology reflect our best efforts based upon the prevailing standard of care in the environmental industry.

The information contained in this report was prepared based upon specific parameters and regulations in force at the time of this report. The information herein is only for the specific use of the client and GLE. GLE accepts no responsibility for the use, interpretation, or reliance by other parties on the information contained herein, unless prior written authorization has been obtained from GLE.

**APPENDIX A**  
**Analytical Results and Chain of Custody**

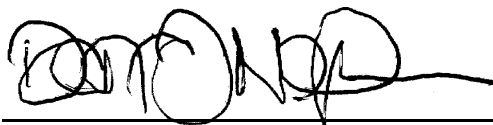
## SUMMARY OF BULK SAMPLE ANALYSIS

**St. John's River State College; Limited Reno Bldg. L Orange Park**

19000-21328

Sample	Sample Type	Fiber Type	
CT-01A	2' X 2' White Smooth Texture Ceiling Tile	70%	Mineral Wool
		30%	Perlite, Quartz, Calcite
CT-01B	2' X 2' White Smooth Texture Ceiling Tile	70%	Mineral Wool
		30%	Perlite, Quartz, Calcite
CT-01C-QC	2' X 2' White Smooth Texture Ceiling Tile	70%	Mineral Wool
		30%	Perlite, Quartz, Calcite
DW-01A	Drywall & Joint Compound	100%	Gypsum, Quartz, Calcite, Clay
DW-01B	Drywall & Joint Compound	100%	Gypsum, Quartz, Calcite, Clay
DW-01C	Drywall & Joint Compound	100%	Gypsum, Quartz, Calcite, Clay
VB-01A	4" Gray Vinyl Cove Base & Yellos Mastic	100%	Polymer
VB-01B	4" Gray Vinyl Cove Base & Yellos Mastic	100%	Polymer
VB-01C	4" Gray Vinyl Cove Base & Yellos Mastic	100%	Polymer
CT-02A	2' X 2' White Wormhole Ceiling Tile	30%	Perlite, Quartz, Calcite
		70%	Mineral Wool
CT-02B	2' X 2' White Wormhole Ceiling Tile	70%	Mineral Wool
		30%	Perlite, Quartz, Calcite

Analyst / Approved  
Signatory:



Darryl Neldner

\* Polarized Light Microscopy coupled with dispersion is the technique used for identification in accordance with EPA 600/M4-82-020, EPA 600/R-93/116, and NIOSH Method 9002.

\*\* The percentage of each component is visually estimated. The result of this analysis relate only to the material tested. The report shall not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. (>1% greater than one percent, <1% less than one percent) QC - Sample reanalyzed for QA/QC.

\*\*\* This report shall not be reproduced except in full, without the written approval of the laboratory. GLE Report # 24349

Analysis performed by GLE Associates, Inc. NVLAP Code 102003-0, CO AL-17485, TX 30-0337

Feedback regarding laboratory performance should be addressed to lab@gleassociates.com.

Report Date: 7/31/2019

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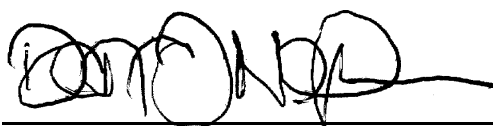
## SUMMARY OF BULK SAMPLE ANALYSIS

### St. John's River State College; Limited Reno Bldg. L Orange Park

19000-21328

Sample	Sample Type		Fiber Type
CT-02C	2' X 2' White Wormhole Ceiling Tile	70%	Mineral Wool
		30%	Perlite, Quartz, Calcite
M-01A-QC	Gray Grout & 6" Blue Ceramic Floor Tile	100%	Quartz, Calcite, Clay, Mica
M-01B	Gray Grout & 6" Blue Ceramic Floor Tile	100%	Quartz, Calcite, Clay, Mica
M-01C	Gray Grout & 6" Blue Ceramic Floor Tile	100%	Quartz, Calcite, Clay, Mica
FT-01A	12" Light Blue Floor Tile & Yellow Mastic	100%	Polymer, Quartz, Calcite, Clay, Mica
FT-01B	12" Light Blue Floor Tile & Yellow Mastic	100%	Polymer, Quartz, Calcite, Clay, Mica
FT-01C	12" Light Blue Floor Tile & Yellow Mastic	100%	Polymer, Quartz, Calcite, Clay, Mica
VB-02A	4" Blue Vinyl Cove Base & Tan Mastic	100%	Polymer
VB-02B	4" Blue Vinyl Cove Base & Tan Mastic	100%	Polymer
VB-02C	4" Blue Vinyl Cove Base & Tan Mastic	100%	Polymer
FT-02A	12" White & Gray Speck Floor Tile & Tan Mastic	100%	Polymer, Quartz, Calcite, Clay, Mica

Analyst / Approved  
Signatory:



Darryl Neldner

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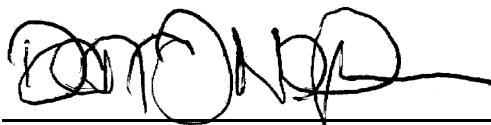
## SUMMARY OF BULK SAMPLE ANALYSIS

### St. John's River State College; Limited Reno Bldg. L Orange Park

19000-21328

Sample	Sample Type	Fiber Type	
FT-02B-QC	12" White & Gray Speck Floor Tile & Tan Mastic	100%	Polymer, Quartz, Calcite, Clay, Mica
FT-02C	12" White & Gray Speck Floor Tile & Tan Mastic	100%	Polymer, Quartz, Calcite, Clay, Mica
CT-03A	2' X 4' White Fissure Ceiling Tile	70%	Mineral Wool
		30%	Perlite, Quartz, Calcite
CT-03B	2' X 4' White Fissure Ceiling Tile	70%	Mineral Wool
		30%	Perlite, Quartz, Calcite
CT-03C	2' X 4' White Fissure Ceiling Tile	70%	Mineral Wool
		30%	Perlite, Quartz, Calcite
VB-03A	6" Black Vinyl Cove Base & Tan Mastic	100%	Polymer
VB-03B	6" Black Vinyl Cove Base & Tan Mastic	100%	Polymer
VB-03C	6" Black Vinyl Cove Base & Tan Mastic	100%	Polymer
MSU-01A	Gray Vinyl Sheet Flooring & Tan Mastic	20%	Cellulose/paper
		80%	Polymer, Quartz, Calcite, Clay, Mica
MSU-01B	Gray Vinyl Sheet Flooring & Tan Mastic	20%	Cellulose/paper
		80%	Polymer, Quartz, Calcite, Clay, Mica
MSU-01C-QC	Gray Vinyl Sheet Flooring & Tan Mastic	20%	Cellulose/paper
		80%	Polymer, Quartz, Calcite, Clay, Mica

Analyst / Approved Signatory:



Darryl Neldner

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\*\* The percentage of each component is visually estimated. The result of this analysis relate only to the material tested. The report shall not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. (>1% greater than one percent, <1% less than one percent) QC - Sample reanalyzed for QA/QC.

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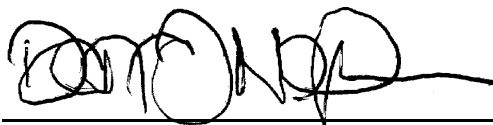
## SUMMARY OF BULK SAMPLE ANALYSIS

### St. John's River State College; Limited Reno Bldg. L Orange Park

19000-21328

Sample	Sample Type	Fiber Type
VB-04A	4" Black Vinyl Cove Base & Tan Mastic	100% Polymer
VB-04B	4" Black Vinyl Cove Base & Tan Mastic	100% Polymer
VB-04C	4" Black Vinyl Cove Base & Tan Mastic	100% Polymer
FT-03A	12" White & Gray Floor Tile & Tan Mastic	100% Polymer, Quartz, Calcite, Clay, Mica
FT-03B	12" White & Gray Floor Tile & Tan Mastic	100% Polymer, Quartz, Calcite, Clay, Mica
FT-03C	12" White & Gray Floor Tile & Tan Mastic	100% Polymer, Quartz, Calcite, Clay, Mica
M-02A	Gray Sink Undercoat	100% Polymer, Quartz, Calcite, Clay, Mica
M-02B	Gray Sink Undercoat	100% Polymer, Quartz, Calcite, Clay, Mica
M-02C	Gray Sink Undercoat	100% Polymer, Quartz, Calcite, Clay, Mica
M-03A-QC	Gray Grout & Red Ceramic Tile	100% Quartz, Calcite, Clay, Mica
M-03B	Gray Grout & Red Ceramic Tile	100% Quartz, Calcite, Clay, Mica
M-03C	Gray Grout & Red Ceramic Tile	100% Quartz, Calcite, Clay, Mica
MAS-01A	White Duct Mastic	100% Polymer, Quartz, Calcite, Clay, Mica

Analyst / Approved  
Signatory:



Darryl Neldner

\* Polarized Light Microscopy coupled with dispersion is the technique used for identification in accordance with EPA 600/M4-82-020, EPA 600/R-93/116, and NIOSH Method 9002.

\*\* The percentage of each component is visually estimated. The result of this analysis relate only to the material tested. The report shall not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. (>1% greater than one percent, <1% less than one percent) QC - Sample reanalyzed for QA/QC.

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Analysis performed by GLE Associates, Inc. NVLAP Code 102003-0, CO AL-17485, TX 30-0337

Feedback regarding laboratory performance should be addressed to lab@gleassociates.com.

Report Date: 7/31/2019

Page 4 of 5

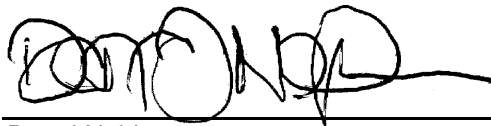
## SUMMARY OF BULK SAMPLE ANALYSIS

St. John's River State College; Limited Reno Bldg. L Orange Park

19000-21328

Sample	Sample Type		Fiber Type
MAS-01B	White Duct Mastic	100%	Polymer, Quartz, Calcite, Clay, Mica
MAS-01C	White Duct Mastic	100%	Polymer, Quartz, Calcite, Clay, Mica
FP-01A	Tan Fire Proofing	100%	Cellulose/paper
FP-01B	Tan Fire Proofing	100%	Cellulose/paper
FP-01C	Tan Fire Proofing	100%	Cellulose/paper
MAS-02A	White Mastic on Foam Glass Lines	100%	Polymer, Quartz, Calcite, Clay, Mica
MAS-02B-QC	White Mastic on Foam Glass Lines	100%	Polymer, Quartz, Calcite, Clay, Mica
MAS-02C	White Mastic on Foam Glass Lines	100%	Polymer, Quartz, Calcite, Clay, Mica
MAS-03A	White Mastic Within Foam Glass Lines	100%	Polymer, Quartz, Calcite, Clay, Mica
MAS-03B	White Mastic Within Foam Glass Lines	100%	Polymer, Quartz, Calcite, Clay, Mica
MAS-03C	White Mastic Within Foam Glass Lines	100%	Polymer, Quartz, Calcite, Clay, Mica

Analyst / Approved  
Signatory:



Darryl Neldner

\* Polarized Light Microscopy coupled with dispersion is the technique used for identification in accordance with EPA 600/M4-82-020, EPA 600/R-93/116, and NIOSH Method 9002.

\*\* The percentage of each component is visually estimated. The result of this analysis relate only to the material tested. The report shall not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. (>1% greater than one percent, <1% less than one percent) QC - Sample reanalyzed for QA/QC.

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Feedback regarding laboratory performance should be addressed to lab@gleassociates.com.

Report Date: 7/31/2019

Page 5 of 5

**CHAIN OF CUSTODY/SAMPLE TRANSMITTAL FORM**



GLE Associates, Inc.  
8659 Baypine Road, Suite 306  
Jacksonville, FL 32256  
PHONE: (904) 296-1880 FAX: (904) 296-1860

CLIENT:	St Johns River State College	21319
PROJECT #:	19000-21328	
PROJECT:	Limited Reno Bldg L Orange Park	
LABORATORY SENT TO:	GLE Tampa	
DATE:	7/30/19	

**SAMPLE INFORMATION**

SAMPLE #	DESCRIPTION	SAMPLE #	DESCRIPTION
CT 01 ABC	2'x2' White Smooth Texture Ceiling Tile	VB 04 ABC	4" Black Vinyl Cove Base w/ Tan Mastic
DW 01 ABC	Drywall and Joint Compound	FEO3 ABC	12" White & Gray Floor Tile w/ Tan Mastic
VB 01 ABC	4" Gray Vinyl Cove Base w/ Yellow Mastic	M 02 ABC	Gray Sunk Undercoat
CT 02 ABC	2'x2' White Wornhole Ceiling Tile	M 03 ABC	Gray grout assoc. w/ Red Ceramic Tile
M 01 ABC	Gray Grout assoc. w/ 6" Blue Ceramic Floor Tile	MAS 01 ABC	White Duct Mastic
FT 01 ABC	12" Light Blue Floor Tile w/ Yellow Mastic	FP 01 ABC	Tan Fireproofing
VB 02 ABC	4" Blue Vinyl Cove Base w/ Tan Mastic	MAS 02 ABC	White Mastic on Foamylass Lines
FT 02 ABC	12" White w/ Gray Spck Floor Tile w/ Tan Mastic	MAS 03 ABC	White Mastic within Foamylass Lines
CT 03 ABC	2'x4' White Fissure Ceiling Tile		
VB 03 ABC	6" Black Vinyl Cove Base w/ Tan Mastic		
MSU 01 ABC	Gray Vinyl Sheet Flooring w/ Tan Mastic		

<b>IMPORTANT: TOTAL NUMBER OF SAMPLES SUBMITTED</b>	57
<b>IMPORTANT: POSITIVE STOP ANALYSIS</b>	Yes
<b>IMPORTANT: E-MAIL RESULTS TO</b>	J Elliott SCIOCEVICH ELIWARD

**NOTE:**

Turnaround time starts at receipt by lab and does not include weekend or holidays.

**Select Turnaround Time**

3 hour   
  6 Hour   
  24 Hour   
  48 Hour   
 3 Day   
 4 Day

**REPORT RESULTS TO THE ADDRESS ABOVE**

CHAIN OF CUSTODY: GLE ASSOCIATES, INC.	CHAIN OF CUSTODY: LABORATORY
PACKAGED BY: E. Liward	SAMPLES RECEIVED BY: [Signature]
DATE PACKAGED: 7/30/19	DATE: 7/30/19
METHOD OF TRANSMITTAL: Fed Ex	TIME: [Signature]
TRANSMITTED BY: [Signature]	CONDITION OF PACKAGED SAMPLES: [Signature]
CHAIN OF CUSTODY: RETURNED TO GLE ASSOCIATES, INC.	
RECEIVED BY:	DATE:
INVENTORIED BY:	DATE:
REPACKAGED AND SEALED BY:	DATE:



**APPENDIX B**  
**Personnel and Laboratory Certifications**



RICK SCOTT, GOVERNOR

JONATHAN ZACHEM, SECRETARY



**STATE OF FLORIDA**  
**DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION**  
**ASBESTOS LICENSING UNIT**

THE ASBESTOS BUSINESS ORGANIZATION HEREIN IS LICENSED UNDER THE  
PROVISIONS OF CHAPTER 469, FLORIDA STATUTES

**GLE ASSOCIATES INC**

ROBERT BLAIR GREENE  
5405 CYPRESS CENTER DRIVE  
SUITE 110  
TAMPA FL 33609

**LICENSE NUMBER: ZA0000034**

**EXPIRATION DATE: NOVEMBER 30, 2019**

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RICK SCOTT, GOVERNOR

JONATHAN ZACHEM, SECRETARY



**STATE OF FLORIDA**  
**DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION**  
**ASBESTOS LICENSING UNIT**

THE ASBESTOS CONSULTANT - ENGINEER HEREIN IS LICENSED UNDER THE  
PROVISIONS OF CHAPTER 469, FLORIDA STATUTES

**GREENE, ROBERT BLAIR**

GLE ASSOCIATES INC  
5405 CYPRESS CENTER DR  
SUITE 110  
TAMPA FL 33609

**LICENSE NUMBER: EA0000009**

**EXPIRATION DATE: NOVEMBER 30, 2020**

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# GLE Associates, Inc. FL 49-0001218

5405 Cypress Center Drive ~ Suite 110 ~ Tampa, Florida 33609 ~ (813) 241-8350

certifies that

Erik Kinard

has completed the requisite training for  
**ASBESTOS INSPECTOR REFRESHER**  
accreditation under TSCA Title II Course No.: FL 49-0002824

conducted on

August 4, 2018

at

TAMPA, FLORIDA

Certificate Number

6358

Passed Exam with score of 70% or better.

EPA Accreditation Expires: August 4, 2019

Instructor

GLE Associates, Inc.

Robert B. Greene

United States Department of Commerce  
National Institute of Standards and Technology



**Certificate of Accreditation to ISO/IEC 17025:2005**

**NVLAP LAB CODE: 102003-0**

**GLE Associates, Inc.**  
Tampa, FL

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

**Asbestos Fiber Analysis**

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality  
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).*

2019-04-01 through 2020-03-31

*Effective Dates*



*[Signature]*  
For the National Voluntary Laboratory Accreditation Program



**SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005**

**GLE Associates, Inc.**  
5405 Cypress Center Drive  
Suite 110  
Tampa, FL 33609  
Mr. Darryl S. Neldner  
Phone: 813-241-8350 x247 Fax: 813-241-8737  
Email: [dneldner@gleassociates.com](mailto:dneldner@gleassociates.com)  
<http://www.gleassociates.com>

**ASBESTOS FIBER ANALYSIS**

**NVLAP LAB CODE 102003-0**

**Bulk Asbestos Analysis**

<u>Code</u>	<u>Description</u>
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

A handwritten signature in black ink, appearing to read "Darryl S. Neldner".

For the National Voluntary Laboratory Accreditation Program

**APPENDIX C**  
**Asbestos Sample Location Plan**

ST. JOHNS RIVER  
STATE COLLEGE  
ORANGE PARK CAMPUS  
283 COLLEGE DRIVE  
ORANGE PARK, FL  
32065-7650



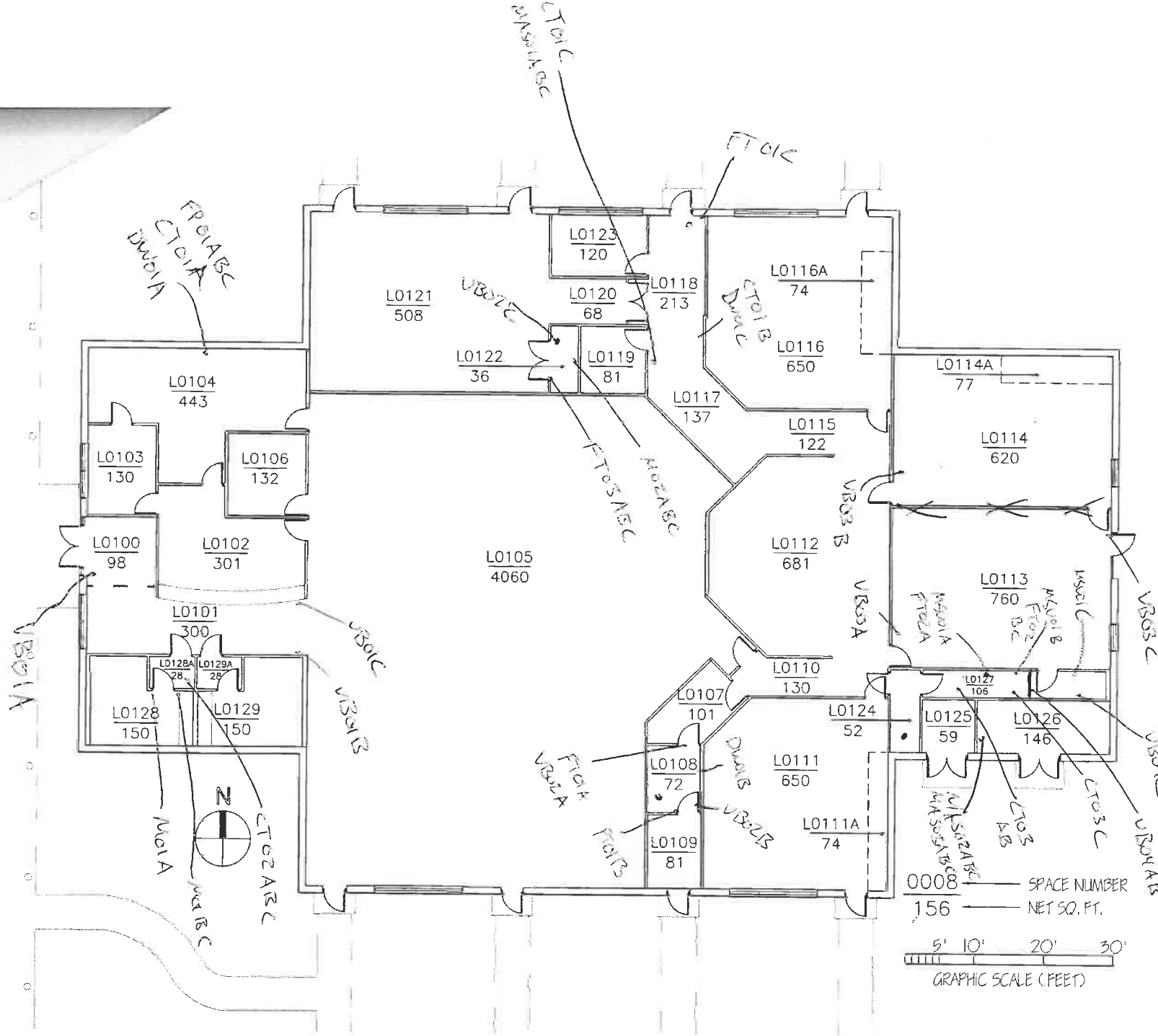
GSF: 14,702  
NSF: 10,065



# LEARNING RESOURCE CENTER

FLOOR PLAN

DESIGN ARCHITECTS/PALMER, INC.  
4/13/2011 DWG. OPC-04





SECTION 00 31 32 – GEOTECHNICAL DATA

1.1 GEOTECHNICAL DATA

- A. This document provides Owner's information for Bidders' convenience and is not meant to supplement the Bidders' own investigations. The attachment is made available for Bidders' information only.
- B. The subsurface soil investigation is to determine the nature of the soil below the natural grade has been made at various locations on the site. Test borings indicate only the soil conditions at the points where samples were taken and are not intended to indicate the soil conditions for the entire site.
- C. Data on indicated subsurface conditions is not intended as representations or warranties of accuracy or continuity of such soil conditions between soil borings. It is expressly understood that the Owner will not be responsible for interpretations or conclusions drawn there from by Bidders.
- D. Test boring and exploratory operations may be made by the Contractor at no additional cost to the Owner.
- E. The complete soil investigation data report is made available for the convenience of the Contractor only and is included herewith as follows:
- F. Report of Geotechnical Engineering Study Report – *Report of a Geotechnical Exploration* prepared by Universal Engineering Sciences, Report No. 1719887, dated October 23, 2019.

END OF SECTION 00 31 32





# **UNIVERSAL ENGINEERING SCIENCES**

## **REPORT OF A GEOTECHNICAL EXPLORATION**

**St. Johns River State College  
Library Building Addition  
Orange Park, Florida**

**October 23, 2019**

**PROJECT NO. 0930.1900181.0000  
REPORT NO. 1719887**

*Prepared for:*

**St. Johns River State College  
5001 St. Johns Avenue  
Palatka, Florida 32177**

*Prepared by:*

**UNIVERSAL ENGINEERING SCIENCES  
5561 Florida Mining Boulevard South  
Jacksonville, Florida 32257-3648  
(904) 296-0757**

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Offices in: Orlando • Daytona Beach • Fort Myers • Gainesville • Jacksonville • Ocala • Palm Coast • Rockledge • Sarasota • Miami  
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- Palm Coast
- Panama City
- Pensacola
- Rockledge
- Sarasota
- St. Petersburg
- Tampa
- Tifton
- West Palm Beach

October 23, 2019

St. Johns River State College  
5001 St. Johns Avenue  
Palatka, Florida 32177

Attention: Mr. Mike Canaday

Reference: **REPORT OF A GEOTECHNICAL EXPLORATION**  
St. Johns River State College Library Building Addition  
Orange Park, Florida  
UES Project No. 0930.1900181.0000 and Report No. 1719887

Dear Mr. Canaday:

Universal Engineering Sciences, Inc. has completed a subsurface exploration at the site of the proposed project located in Orange Park, Florida. These services were provided in general accordance with our Proposal No. 1694522, dated August 10, 2019. This report contains the results of our exploration, an engineering evaluation with respect to the project characteristics described to us, and recommendations for groundwater considerations, foundation design, retaining wall design, and site preparation. A summary of our findings is as follows:

- The borings generally encountered loose to medium dense fine sand, fine sand with silt, and fine sand with clay (SP, SP-SM, SP-SC) from the existing ground surface to depths of 32 feet below the existing ground surface. Dense to very dense fine sand (SP) was then penetrated to a depth of 42 feet. Loose very clayey fine sand (SC) and soft clay (CH) then extended to the deepest boring termination depth of 50 feet below existing grade.
- We measured the groundwater level at the boring locations between depths of 2.5 to 15.0 feet below the existing ground surface at the time of our exploration. The variation in groundwater level is likely attributed to topographical differentials and the proximity to drainage features. We estimate the seasonal high groundwater level will occur approximately 1.0 foot above the measured groundwater levels at the time of our exploration.




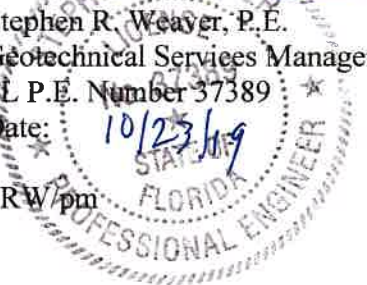
- Assuming the building area will be constructed in accordance with our Site Preparation Recommendations, we have recommended the proposed structure be supported on conventional, shallow spread foundations with an allowable soil bearing pressure of 2,500 pounds per square foot.
- Based on the boring performed in the proposed stormwater expansion area, the soils described as fine sand, fine sand with silt, and fine sand with clay (SP, SP-SM, SP-SC) as encountered from ground level to the termination depth of 6 feet are considered suitable for use as structural fill. It should be understood that soils excavated from below the water table may be excessively wet and may require stockpiling or spreading to dry prior to placement and compaction.
- We recommend only normal, good practice site preparation techniques to prepare the existing subgrade to support the proposed structure. These techniques include clearing the construction area, removing/relocating existing utilities, dewatering if warranted, stripping topsoils and vegetation, compacting the subgrade and placing engineered fill to the desired grades.


We trust this report meets your needs and addresses the geotechnical issues associated with the proposed construction. We appreciate the opportunity to have worked with you on this project and look forward to a continued association. Please do not hesitate to contact us if you should have any questions, or if we may further assist you as your plans proceed.

Respectfully submitted,

**UNIVERSAL ENGINEERING SCIENCES, INC.**

Certificate of Authorization No. 549

  
Stephen R. Weaver, P.E.  
Geotechnical Services Manager  
FL P.E. Number 37389  
Date: 10/23/19  
SRW/pm  


  
Payton W. Mann, E.I.  
Project Engineer  
Date: 10/23/19



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## 1.0 INTRODUCTION

In this report, we present the results of the subsurface exploration of the site for the proposed project at St. Johns River State College located in Orange Park, Florida. We have divided this report into the following sections:

- SCOPE OF SERVICES - Defines what we did
- FINDINGS - Describes what we encountered
- RECOMMENDATIONS - Describes what we encourage you to do
- LIMITATIONS - Describes the restrictions inherent in this report
- APPENDICES - Presents support materials referenced in this report

## 2.0 SCOPE OF SERVICES

### 2.1 PROJECT DESCRIPTION

Project information was provided to us in recent correspondence with you. We were provided with a copy of Architectural Plans (sheets GTR-1 and C-02) prepared by Harvard-Jolly dated 6/14/2019 and 6/28/2019. These plans show the existing and proposed site layout and the requested boring locations.

We understand that the project consists of construction of an addition to Library Building at the St. Johns River State College Orange Park campus. The addition will be a one-story structure. Detailed structural loading information has not been provided to us, therefore we assume maximum column and wall loads will not exceed 75 kips and 3 klf, respectively. It is understood that up to five feet of elevating fill may be required in some portions of the addition. It is understood the proposed construction will also include retaining walls to accommodate potential grade changes and expansion of an existing pond.

We note that since the applicability of geotechnical recommendations is very dependent upon project characteristics, most specifically: improvement locations, grade alterations, and actual structural loads applied, UES must review the preliminary and final site and grading plans, and structural design loads to validate all recommendations rendered herein. Without such review our recommendations should not be relied upon for final design or construction of any site improvements.

### 2.2 PURPOSE

The purposes of this exploration were:

- to explore the general subsurface conditions at the site for the proposed construction;
- to interpret and evaluate the subsurface conditions with respect to the proposed construction; and



- to provide geotechnical engineering recommendations for groundwater considerations, foundation and retaining wall design, stormwater management, and site preparation.

This report presents an evaluation of site conditions on the basis of traditional geotechnical procedures for site characterization. The recovered samples were not examined, either visually or analytically, for chemical composition or environmental hazards. Universal Engineering Sciences would be pleased to perform these services, if you desire.

Our exploration was confined to the zone of soil likely to be stressed by the proposed construction. Our work did not address the potential for surface expression of deep geological conditions. This evaluation requires a more extensive range of field services than performed in this study. We will be pleased to conduct an investigation to evaluate the probable effect of the regional geology upon the proposed construction, if you desire.

### **2.3 FIELD EXPLORATION**

A field exploration was performed on October 3, 2019. The approximate boring locations are shown on the attached Boring Location Plan in Appendix A. The approximate boring locations were determined in the field by our personnel using a hand-held GPS unit, and should be considered accurate only to the degree implied by the method of measurement used. Samples of the soils encountered will be held in our laboratory for your inspection for 60 days unless we are notified otherwise.

#### **2.3.1 Auger Boring**

To determine the subsurface conditions within the proposed stormwater expansion area, we located and drilled one (1) auger boring to a depth of approximately six feet below the existing ground surface in general accordance with the methodology outlined in ASTM D 1452. A summary of this field procedure is included in Appendix A. Representative soil samples recovered from the auger boring were returned to our laboratory for further evaluation.

#### **2.3.2 SPT Borings**

To explore the subsurface conditions within the area of the proposed building addition and retaining wall, we located and drilled seven (7) Standard Penetration Test (SPT) borings to depths of 20 to 50 feet below the existing ground surface in general accordance with the methodology outlined in ASTM D 1586. A summary of this field procedure is included in Appendix A. Split-spoon soil samples recovered during performance of the borings were visually classified in the field and representative portions of the samples were transported to our laboratory for further evaluation.





## 2.4 LABORATORY TESTING

Representative soil samples obtained during our field exploration were returned to our laboratory. The samples were reviewed by a geotechnical engineer and were visually classified in general accordance with ASTM D 2488 (Unified Soil Classification System).

Seventeen (17) fines content tests, seventeen (17) moisture content tests, and one (1) Atterberg limits test were conducted in the laboratory on representative soil samples obtained from the borings. These tests were performed to aid in classifying the soils and to help quantify and correlate engineering properties. The results of these tests are presented on the Boring Logs in Appendix A. A brief description of the laboratory procedures used is also provided in Appendix A.

## 3.0 FINDINGS

### 3.1 SOIL SURVEY

Based on the Soil Survey for Clay County, Florida, as prepared by the US Department of Agriculture Soil Conservation Service, the predominant predevelopment soil type at the site is identified as Centenary (7).

A summary of characteristics of this soil series was obtained from the Soil Survey and is included in Table 1.

TABLE 1 Summary of Soil Survey Information							
Soil Type	Constituents		Hydrologic Group	Natural Drainage	Soil Permeability (Inches/Hr)		Seasonal High Water Table
Centenary (7)	0-5" 5-54" 54-80"	Fine sand Sand, fine sand Sand, fine sand	A	Somewhat Poorly Drained	0-5" 5-54" 56-80"	6.0 – 20 6.0 – 20 2.0 – 6.0	3.5 – 5.0

### 3.2 SURFACE CONDITIONS

The site of the proposed construction is located at St. Johns River State College, south of the existing library in Orange Park, Florida. At the time of our exploration the site consisted of maintained grass with a few scattered oak and palm trees. Four wet retention ponds are located south and east of the site. The surrounding buildings to the north, west, and south appeared to be in relatively good condition. Additionally, based on the topography provided the elevations range from El. +40 to 55 feet and visually appears to be a hillside, sloping down towards the south to southeast.



### 3.3 SUBSURFACE CONDITIONS

The boring locations and detailed subsurface conditions are illustrated in Appendix A: Boring Location Plan and Boring Logs. It should be noted that soil conditions will vary away from and between boring locations. The classifications and descriptions shown on the logs are generally based upon visual characterizations of the recovered soil samples and a limited number of laboratory tests. Also, see Appendix A: Key to Boring Logs, for further explanation of the symbols and placement of data on the Boring Logs. Table 2: General Soil Profile, summarizes the soil conditions encountered.

<b>TABLE 2 General Soil Profile</b>		
<b>Typical depth (ft)</b>		<b>Soil Descriptions</b>
<b>From</b>	<b>To</b>	
0	32	Loose to medium dense fine sand, fine sand with silt, and fine sand with clay (SP, SP-SM, SP-SC)
32	42	Dense to very dense fine sand (SP)
42	50*	Loose very clayey fine sand (SC) and soft clay (CH)
* Termination Depth of Deepest Boring ( ) Indicates Unified Soil Classification		

The groundwater level was recorded 24 hours after the time of drilling between depths of 2.5 to 15.0 feet below the existing ground surface. The variation in groundwater level is likely attributed to topographical differentials and the proximity to drainage features. It should be anticipated the groundwater level will fluctuate due to topography, seasonal climatic variations, surface water runoff patterns, construction operations, and other interrelated factors.

### 4.0 RECOMMENDATIONS

#### 4.1 GENERAL

In this section of the report, we present our detailed recommendations for groundwater control, building foundation, retaining wall design, stormwater management, site preparation, and construction related services. The following recommendations are made based upon a review of the attached soil test data, our understanding of the proposed construction, and experience with similar projects and subsurface conditions. We recommend that we be provided the opportunity to review the project plans and specifications to confirm that our recommendations have been properly interpreted and implemented. If the structural loadings, building location, or retaining wall location change significantly from those discussed previously, we request the opportunity to review and possibly amend our recommendations with respect to those changes. The discovery of any subsurface conditions during construction which deviate from those encountered in the borings should be reported to us immediately for observation, evaluation and recommendations.



## **4.2 GROUNDWATER CONSIDERATIONS**

The groundwater table will fluctuate seasonally depending upon local rainfall. The rainy season in Northeast Florida is normally between June and September. Based upon our review of U.S.G.S. data, Clay County Soils Survey, and regional hydrogeology, it is our opinion the seasonal high groundwater level will generally occur approximately one foot above the measured groundwater levels.

Note: it is possible the estimated seasonal high groundwater levels will temporarily exceed these estimated levels during any given year in the future. Should impediments to surface water drainage exist on the site, or should rainfall intensity and duration, or total rainfall quantities exceed the normally anticipated rainfall quantities, groundwater levels may exceed our seasonal high estimates. We recommend positive drainage be established and maintained on the site during construction. We further recommend permanent measures be constructed to maintain positive drainage from the site throughout the life of the project.

## **4.3 BUILDING FOUNDATIONS**

Based on the results of our exploration, we consider the subsurface conditions at the site adaptable for support of the proposed structure when constructed on a properly designed conventional shallow foundation systems. Provided the site preparation and earthwork construction recommendations outlined in Section 4.5 of this report are performed, the following parameters may be used for foundation design.

### **4.3.1 Bearing Pressure**

The maximum allowable net soil bearing pressure for use in shallow foundation design should not exceed 2,500 psf. Net bearing pressure is defined as the soil bearing pressure at the foundation bearing level in excess of the natural overburden pressure at that level. The foundations should be designed based on the maximum load which could be imposed by all loading conditions.

### **4.3.2 Foundation Size**

The minimum widths recommended for any isolated column footings and continuous wall footings are 24 inches and 18 inches, respectively. Even though the maximum allowable soil bearing pressure may not be achieved, these width recommendations should control the minimum size of the foundations.

### **4.3.3 Bearing Depth**

The exterior foundations should bear at a depth of at least 18 inches below the finished exterior grades and the interior foundations should bear at a depth of at least 12 inches below the finish floor elevation to provide confinement to the bearing level soils. It is recommended that stormwater be diverted away from the building exteriors to reduce the possibility of erosion beneath the exterior footings.



#### **4.3.4 Bearing Material**

The foundations may bear in either the compacted suitable natural soils or compacted structural fill. The bearing level soils, after compaction, should exhibit densities equivalent to at least 95 percent of the Modified Proctor maximum dry density (ASTM D 1557) to a depth of at least one foot below the foundation bearing level.

#### **4.3.5 Settlement Estimates**

Post-construction settlements of the building and retaining wall structures will be influenced by several interrelated factors, such as (1) subsurface stratification and strength/compressibility characteristics; (2) footing size, bearing level, applied loads, and resulting bearing pressures beneath the foundations; and (3) site preparation and earthwork construction techniques used by the contractor. Our settlement estimates for the structures are based on the use of site preparation/earthwork construction techniques as recommended in Section 4.5 of this report. Any deviation from these recommendations could result in an increase in the estimated post-construction settlements of the structures.

Using the recommended maximum bearing pressure, the assumed maximum structural loads and the field data which we have correlated to geotechnical strength and compressibility characteristics of the subsurface soils, we estimate that total settlements of the structures could be on the order of one inch or less.

Differential settlements result from differences in applied bearing pressures and variations in the compressibility characteristics of the subsurface soils. Because of the general uniformity of the subsurface conditions and the recommended site preparation and earthwork construction techniques outlined in Section 4.5, we anticipate that differential settlements of the structures should be within tolerable magnitudes ( $\frac{1}{2}$  inch or less). The estimated differential settlements are considered structurally tolerable; however, aesthetic cracking may occur. The project budget should account for any cosmetic repairs.

#### **4.3.6 Floor Slabs**

The floor slab can be constructed as a slab-on-grade member using a modulus of subgrade reaction (K) of 100 pci provided the subgrade materials are compacted as outlined in Section 4.5. It is recommended the floor slab bearing soils be covered with an impervious membrane to reduce moisture entry and floor dampness in accordance with the 2017 Florida Building Code, 6<sup>th</sup> Edition. A 10-mil thick plastic membrane is commonly used for this purpose. Care should be exercised not to tear the membrane during placement of reinforcing steel and concrete.



#### 4.4 RETAINING WALL

Assuming the retaining wall and the subsurface wall will be smooth concrete, we recommend using the parameters indicated in Table 3 for imported free draining fine sand backfill soil compacted to 95 percent of the Modified Proctor test maximum dry density for lateral soil analysis. These soil parameters for the fill may be used in the design of a vertical bulkhead or similar structure where backfill may be required. We recommend the parameters in Table 3A through 3D for the existing on-site soils.

Tables 3 through 3D values do not include a factor of safety and therefore, the designer should incorporate an appropriate factor of safety (note that uplift and lateral hydrostatic pressures could be exerted on the structure during the time of extreme storm events or man-induced causes. These forces should also be included in the proposed design. The retaining wall design should assume that groundwater seepage will occur behind the walls. This seepage must be collected and drained from behind the walls or the wall designed to resist hydrostatic pressure for the full height of the wall.

<b>TABLE 3</b>	
<b>Lateral Earth Pressure Design Parameters (Level Backfill)</b>	
<b>Design Parameter</b>	<b>Recommended Value</b>
At-rest Earth Pressure Coefficient, $K_0$	0.5
Active Earth Pressure Coefficient, $K_a$	0.33
Passive Earth Pressure Coefficient, $K_p$	3.00
Moist and Saturated Unit Weight (pcf)	$\gamma_m = 110$ ; $\gamma_{wet} = 120$
Coefficient of Friction (sliding)	0.4
Angle of Internal Friction, $\phi$	30 degrees
(1) For sloping backfill or backfill with clayey sands the table values must be adjusted.	



<b>TABLE 3A</b>							
<b>Lateral Earth Pressure Design Parameters (SB-4)</b>							
Typical Depth (ft)		Total Unit Weight (pcf)	Friction Angle (Degrees)	Cohesion (psf)	Recommended Earth Pressure Coefficients		
From	To				At Rest (K <sub>o</sub> )	Active (K <sub>a</sub> )	Passive (K <sub>p</sub> )
0	6	100	28	--	0.53	0.36	2.77
6	17	110	31	--	0.48	0.32	3.12
17	20	120	38	--	0.38	0.24	4.20

\* The groundwater level should be assumed five feet below ground surface for design purposes to account for extreme storm events.

<b>TABLE 3B</b>							
<b>Lateral Earth Pressure Design Parameters (SB-5)</b>							
Typical Depth (ft)		Total Unit Weight (pcf)	Friction Angle (Degrees)	Cohesion (psf)	Recommended Earth Pressure Coefficients		
From	To				At Rest (K <sub>o</sub> )	Active (K <sub>a</sub> )	Passive (K <sub>p</sub> )
0	16	100	28	--	0.53	0.36	2.77
16	20	115	33	--	0.46	0.29	3.39

\* The groundwater level should be assumed five feet below ground surface for design purposes to account for extreme storm events.

<b>TABLE 3C</b>							
<b>Lateral Earth Pressure Design Parameters (SB-6)</b>							
Typical Depth (ft)		Total Unit Weight (pcf)	Friction Angle (Degrees)	Cohesion (psf)	Recommended Earth Pressure Coefficients		
From	To				At Rest (K <sub>o</sub> )	Active (K <sub>a</sub> )	Passive (K <sub>p</sub> )
0	12	110	30	--	0.50	0.33	3.00
12	20	105	28	--	0.53	0.36	2.77

\* The groundwater level should be assumed five feet below ground surface for design purposes to account for extreme storm events.





<b>TABLE 3D</b>							
<b>Lateral Earth Pressure Design Parameters (SB-7)</b>							
<b>Typical Depth (ft)</b>		<b>Total Unit Weight (pcf)</b>	<b>Friction Angle (Degrees)</b>	<b>Cohesion (psf)</b>	<b>Recommended Earth Pressure Coefficients</b>		
<b>From</b>	<b>To</b>				<b>At Rest (K<sub>o</sub>)</b>	<b>Active (K<sub>a</sub>)</b>	<b>Passive (K<sub>p</sub>)</b>
0	13	110	31	--	0.48	0.32	3.12
13	18	100	28	--	0.53	0.36	2.77
18	25	110	32	--	0.47	0.31	3.25

\* The groundwater level should be assumed five feet below ground surface for design purposes to account for extreme storm events.

Vibrations produced during driving of sheet piles and vibratory compaction operations at the site may be significantly noticeable within 50 feet and may cause settlement distress of adjacent structures, or disturbances of sensitive equipment or personnel in adjoining facilities, if not properly regulated. Therefore, provisions should be made to monitor these vibrations by Universal so that any necessary modifications in the pile driving operations can be made in the field before potential damages occur. In addition, the conditions of the existing adjacent structures should be ascertained and documented prior to pile driving operations.

#### 4.5 SITE PREPARATION

We recommend normal, good practice site preparation procedures. These procedures include: stripping the site of vegetation and topsoil, removing existing utilities, dewatering if warranted, compacting the subgrade, and placing necessary fill or backfill to grade with engineered fill. A more detailed synopsis of this work is as follows:

1. Prior to construction, the location of any existing underground utility lines within the construction area should be established. Provisions should then be made to relocate interfering utilities to appropriate locations. It should be noted that if underground pipes are not properly removed or plugged, they may serve as conduits for subsurface erosion which may subsequently lead to excessive settlement of overlying structure(s).
2. The groundwater level was encountered at depths of 2.5 to 15 feet below the existing ground surface in the borings at the time of our exploration. The variation in groundwater level is likely attributed to topographical differentials and the proximity to drainage features. We estimate the seasonal high groundwater level will occur generally one foot above the measured groundwater levels. The groundwater level should be maintained at least one foot below any excavations and two feet below the surface of any vibratory compaction procedures.



3. Surface stripping and root raking should be performed within and five feet beyond the perimeter of the proposed building areas. Expect typical stripping at this site to a depth of 12 inches more or less.
4. Compact the subgrade from the surface with a medium weight vibratory roller operating until you obtain a minimum density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D-1557), to a depth of two feet below the compacted surface. A minimum of eight (8) complete coverages (in perpendicular directions) should be made in the building construction area with the roller to improve the uniformity and increase the density of the underlying sandy soils.

Should the bearing level soils experience pumping and soil strength loss during the compaction operations, compaction work should be immediately terminated and (1) the disturbed soils removed and backfilled with dry structural fill soils which are then compacted, or (2) the excess pore pressures within the disturbed soils allowed to dissipate before recompaction.

5. Care should be exercised to avoid damaging any nearby structures while the compaction operation is underway. Prior to commencing compaction, occupants of adjacent structures should be notified and the existing conditions of the structures be documented with photographs and survey (if deemed necessary). Compaction should cease if deemed detrimental to adjacent structures. Universal Engineering Sciences can provide vibration monitoring services to help document and evaluate the effects of the surface compaction operation on existing structures. In the absence of vibration monitoring it is recommended the vibratory roller remain a minimum of 50 feet from existing structures. Within this zone, use of a bulldozer or a vibratory roller operating in the static mode is recommended.
6. Place fill material, as required. The fill should consist of "clean," fine sand with less than 5 percent soil fines. You may use fill materials with soil fines between 5 and 12 percent, but strict moisture control may be required. Typically, the soils should exhibit moisture contents within  $\pm 2$  percent of the Modified Proctor optimum moisture content during compaction. Place fill in uniform 10- to 12-inch loose lifts and compact each lift to a minimum density of 95 percent of the Modified Proctor maximum dry density.
7. Perform compliance tests within the fill/backfill at a frequency of not less than one test per 2,500 square feet per lift in the building area, or at a minimum of two tests, whichever is greater.
8. Test all footing cuts for compaction to a depth of one foot. We recommend you conduct density testing in every column footing, and every 100 linear feet in wall footings. recompaction of the foundation excavation bearing level soils, if loosened by the excavation process, can probably be achieved by making several coverages with a light weight walk-behind vibratory sled or roller.





#### **4.6 RETENTION POND CONSIDERATION**

Based on the boring performed in the stormwater expansion area (A-1), the soils described as fine sand, fine sand with silt, and fine sand with clay (SP, SP-SM, SP-SC) as encountered throughout the 6-foot auger boring are considered suitable for use as structural fill. It should be understood that soils excavated from below the water table may be excessively wet and may require stockpiling or spreading to dry prior to placement and compaction. Soils described as fine sand with silt and fine sand with clay (SP-SM, SP-SC) may take longer to dry to appropriate moisture contents than soils described as fine sand (SP). If soils deviate from the encountered material, notify us immediately for observation, evaluation and further recommendations.

#### **5.0 LIMITATIONS**

During the early stages of most construction projects, geotechnical issues not addressed in this report may arise. Because of the natural limitations inherent in working with the subsurface, it is not possible for a geotechnical engineer to predict and address all possible problems. An Association of Engineering Firms Practicing in the Geosciences (ASFE) publication, "Important Information About Your Geotechnical Engineering Report" appears in Appendix B, and will help explain the nature of geotechnical issues.

Further, we present documents in Appendix B: Constraints and Restrictions, to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.



**APPENDIX A**

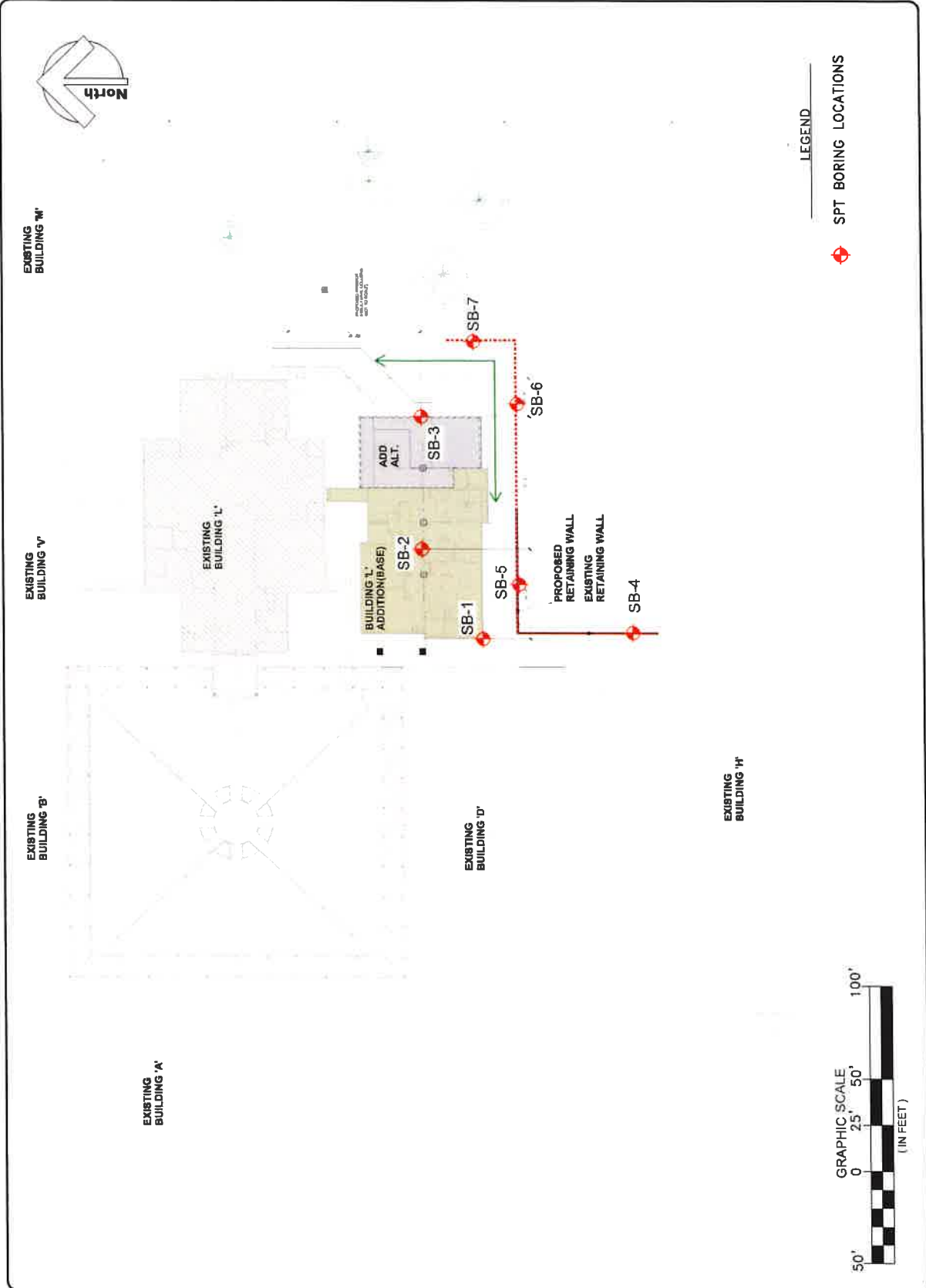
**BORING LOCATION PLAN  
SOIL PROFILES  
BORING LOGS  
KEY TO BORING LOGS  
FIELD EXPLORATION PROCEDURES  
LABORATORY TESTING PROCEDURES**

CLIENT: ST. JOHNS RIVER STATE COLLEGE	
DATE: 10/14/19	DRAWN BY: TW
DATE: 10/14/19	CHECKED BY: PM
SCALE: 1" = 50'	PROJECT NO: 0930.1900181.0000
REPORT NO: 171987	

LIBRARY BUILDING ADDITION  
ORANGE PARK, FLORIDA  
BORING LOCATION PLAN

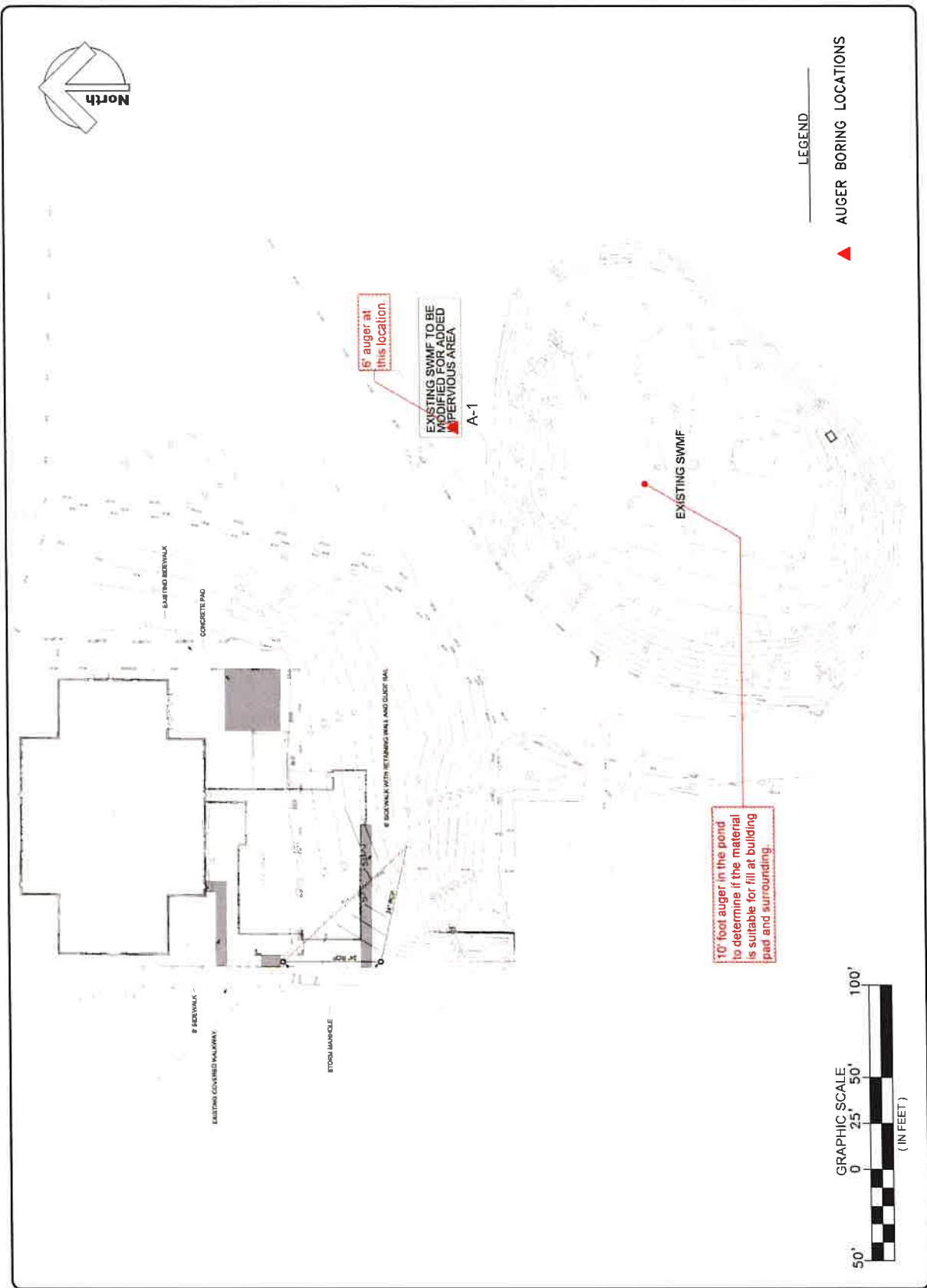


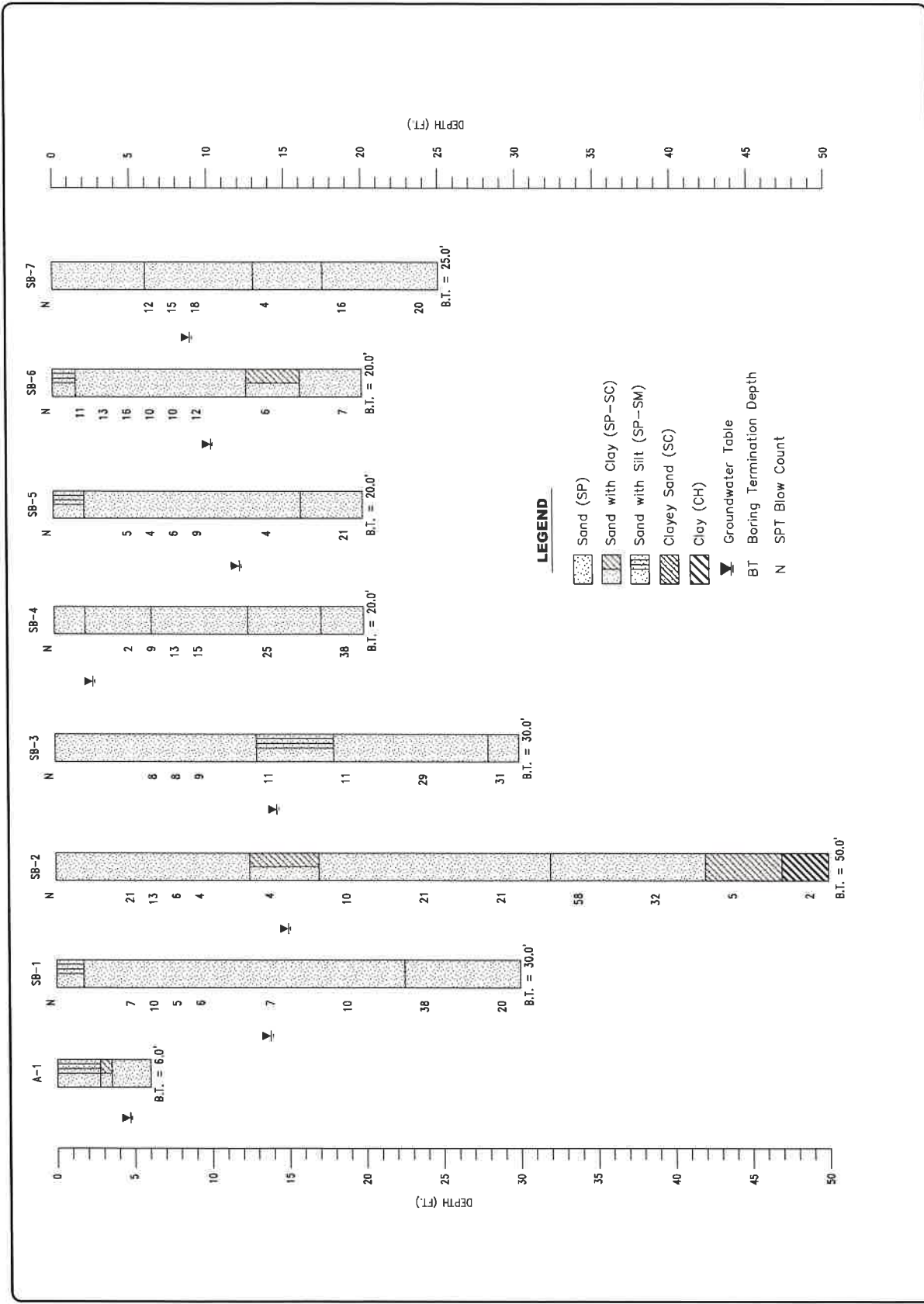
PAGE NO. FIGURE A-1



CLIENT:	ST. JOHNS RIVER STATE COLLEGE
DRAWN BY:	TW
CHECKED BY:	PM
DATE:	10/14/19
SCALE:	1" = 50'
PROJECT NO.:	0930.1900181.0000
REPORT NO.:	1719687

GEOTECHNICAL EXPLORATION  
 LIBRARY BUILDING ADDITION  
 ORANGE PARK, FLORIDA  
 BORING LOCATION PLAN







# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0930.1900181.0000

REPORT NO.: 1719887

PAGE: A-1

PROJECT: GEOTECHNICAL EXPLORATION  
LIBRARY BUILDING ADDITION  
ORANGE PARK, FLORIDA

BORING DESIGNATION: **A-1**  
SECTION: TOWNSHIP:

SHEET: **1 of 1**  
RANGE:

CLIENT: ST. JOHNS RIVER STATE COLLEGE

G.S. ELEVATION (ft): DATE STARTED: 10/3/19

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 4.7 DATE FINISHED: 10/3/19

REMARKS:

DATE OF READING: 10/4/19

DRILLED BY: SV/ST

EST. W.S.W.T. (ft):

TYPE OF SAMPLING: ASTM D 1452

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Brown fine SAND with Silt and trace Organics (SP-SM)						
						Dark grayish-brown fine SAND with Clay (SP-SC)						
5						Gray to brown fine SAND (SP)						

BORING LOG: 0930.1900181.0000-LIBRARY BUILDING ADDITION.GPJ UNIENGS.GDT 10/23/19



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0930.1900181.0000

REPORT NO.: 1719887

PAGE: A-2

PROJECT: GEOTECHNICAL EXPLORATION  
LIBRARY BUILDING ADDITION  
ORANGE PARK, FLORIDA

BORING DESIGNATION: **SB-1**  
SECTION:

TOWNSHIP:

SHEET: **1 of 1**  
RANGE:

CLIENT: ST. JOHNS RIVER STATE COLLEGE

G.S. ELEVATION (ft):

DATE STARTED: 10/3/19

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 13.8

DATE FINISHED: 10/3/19

REMARKS:

DATE OF READING: 10/4/19

DRILLED BY: DB/DH

EST. W.S.W.T. (ft):

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Grayish-brown fine SAND with Silt and trace Concrete fragments (SP-SM) Loose light brown to grayish-brown fine SAND (SP)	3.9	7.1				
5		WOH-2-5	7									
		7-5-5	10									
		3-3-2	5				2.8	5.7				
10		2-2-4	6									
15		3-3-4	7									
20		3-3-7	10									
25		13-16-22	38			Dense to medium dense reddish-brown fine SAND (SP)	5.2	28.7				
30		7-9-11	20									

BORING LOG: 0930.1900181.0000-LIBRARY BUILDING ADDITION.GPJ UNIENGSC.GDT 10/23/19



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0930.1900181.0000

REPORT NO.: 1719887

PAGE: A-3

PROJECT: GEOTECHNICAL EXPLORATION  
LIBRARY BUILDING ADDITION  
ORANGE PARK, FLORIDA

BORING DESIGNATION: **SB-2**  
SECTION:

TOWNSHIP:

SHEET: **1 of 1**  
RANGE:

CLIENT: ST. JOHNS RIVER STATE COLLEGE

G.S. ELEVATION (ft):

DATE STARTED: 10/3/19

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 15.0

DATE FINISHED: 10/3/19

REMARKS:

DATE OF READING: 10/4/19

DRILLED BY: DB/DH

EST. W.S.W.T. (ft):

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Medium dense to loose light brown fine SAND (SP)						
5		5-10-11	21				3.5	7.0				
		8-7-6	13									
		3-3-3	6				3.6	5.5				
10		2-2-2	4									
15		2-2-2	4	▼		Loose brown fine SAND with Clay (SP-SC)						
20		3-4-6	10			Loose to medium dense light brown to reddish-brown fine SAND (SP)	3.9	31.7				
25		8-9-12	21									
30		9-10-11	21									
35		8-18-40	58			Very dense to dense fine SAND (SP)	3.6	24.6				
40		9-16-16	32									
45		3-4-1	5			Loose gray very Clayey fine SAND (SC)						
50		WOH-2	2			Soft gray CLAY (CH) PP=0.5 tsf	94.9	79.9	76	49		

BORING LOG: 0930.1900181.0000-LIBRARY BUILDING ADDITION.GPJ UNENGS.C.GDT 10/23/19





# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0930.1900181.0000

REPORT NO.: 1719887

PAGE: A-4

PROJECT: GEOTECHNICAL EXPLORATION  
LIBRARY BUILDING ADDITION  
ORANGE PARK, FLORIDA

BORING DESIGNATION: **SB-3**  
SECTION: TOWNSHIP:

SHEET: **1 of 1**  
RANGE:

CLIENT: ST. JOHNS RIVER STATE COLLEGE

G.S. ELEVATION (ft): DATE STARTED: 10/3/19

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 14.3 DATE FINISHED: 10/3/19

REMARKS:

DATE OF READING: 10/4/19 DRILLED BY: DB/DH

EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Loose light brown fine SAND (SP)						
3-4-4		8										
4-4-4		8										
4-5-4		9										
6-6-5		11			▼	Medium dense brown fine SAND with Silt (SP-SM)						
2-5-6		11				Medium dense light brown to reddish-brown fine SAND (SP)						
5-12-17		29					2.6	28.2				
10-12-19		31				Dense reddish-brown fine SAND (SP)	4.3	31.4				

BORING LOG: 0930.1900181.0000-LIBRARY BUILDING ADDITION.GPJ UNIENGS.C.GDT 10/23/19



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.:	0930.1900181.0000
REPORT NO.:	1719887
PAGE:	A-5

PROJECT: GEOTECHNICAL EXPLORATION  
LIBRARY BUILDING ADDITION  
ORANGE PARK, FLORIDA

BORING DESIGNATION: **SB-4**  
SECTION: TOWNSHIP:

SHEET: **1 of 1**  
RANGE:

CLIENT: ST. JOHNS RIVER STATE COLLEGE

G.S. ELEVATION (ft):

DATE STARTED: 10/3/19

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 2.5

DATE FINISHED: 10/3/19

REMARKS:

DATE OF READING: 10/4/19

DRILLED BY: DB/DH

EST. W.S.W.T. (ft):

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLING	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Brown fine SAND (SP)						
					▼	Very loose dark brown fine SAND (SP)						
5		2-1-1	2			Loose to medium dense brown fine SAND (SP)	2.1	34.8				
		2-4-5	9									
		3-6-7	13									
10		5-6-9	15									
						Medium dense dark reddish-brown fine SAND with few Hardpan (SP)						
15		7-9-16	25									
						Dense brown fine SAND (SP)						
20		10-16-22	38									

BORING LOG 0930.1900181.0000-LIBRARY BUILDING ADDITION.GPJ\_UNIENGSC.GDT 10/23/19



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0930.1900181.0000
REPORT NO.: 1719887
PAGE: A-6

PROJECT: GEOTECHNICAL EXPLORATION  
LIBRARY BUILDING ADDITION  
ORANGE PARK, FLORIDA

BORING DESIGNATION: **SB-5** SHEET: **1 of 1**  
SECTION: TOWNSHIP: RANGE:

CLIENT: ST. JOHNS RIVER STATE COLLEGE  
LOCATION: SEE BORING LOCATION PLAN  
REMARKS:

G.S. ELEVATION (ft): DATE STARTED: 10/3/19  
WATER TABLE (ft): 12.0 DATE FINISHED: 10/3/19  
DATE OF READING: 10/4/19 DRILLED BY: DB/DH  
EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLER	BLOWS PER 6" INCREMENT	N (BLOWS/FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./DAY)	ORG. CONT. (%)
									LL	PI		
0						Dark grayish-brown fine SAND with Silt (SP-SM)	5.1	8.8				
						Loose light brown to brown fine SAND (SP)						
5		5-3-2	5									
		2-2-2	4									
		2-2-4	6									
10		4-4-5	9									
				▼								
15		1-2-2	4									
						Medium dense reddish-brown fine SAND (SP)						
20		5-8-13	21									

BORING LOG 0930.1900181.0000-LIBRARY BUILDING ADDITION.GPJ UNIENGS.GDT 10/23/19



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0930.1900181.0000

REPORT NO.: 1719887

PAGE: A-7

PROJECT: GEOTECHNICAL EXPLORATION  
LIBRARY BUILDING ADDITION  
ORANGE PARK, FLORIDA

BORING DESIGNATION: **SB-6**  
SECTION: TOWNSHIP:

SHEET: **1 of 1**  
RANGE:

CLIENT: ST. JOHNS RIVER STATE COLLEGE

G.S. ELEVATION (ft):

DATE STARTED: 10/3/19

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 10.2

DATE FINISHED: 10/3/19

REMARKS:

DATE OF READING: 10/4/19

DRILLED BY: DB/DH

EST. W.S.W.T. (ft):

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Brown fine SAND with Silt with trace rubber Debris (SP-SM)						
		6-5-6	11			Medium dense to loose light brown to grayish-brown fine SAND (SP)	4.6	9.1				
		7-6-7	13									
5		6-8-8	16									
		6-5-5	10									
		4-4-6	10									
10		5-6-6	12	▼			3.9	15.5				
						Loose brown fine SAND with Clay (SP-SC)						
15		2-2-4	6									
						Loose reddish-brown fine SAND (SP)						
20		2-2-5	7									

BORING LOG: 0930.1900181.0000-LIBRARY BUILDING ADDITION.CPJ UNENGS.GDT 10/23/19



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO.: 0930.1900181.0000

REPORT NO.: 1719887

PAGE: A-8

PROJECT: GEOTECHNICAL EXPLORATION  
LIBRARY BUILDING ADDITION  
ORANGE PARK, FLORIDA

BORING DESIGNATION: **SB-7**  
SECTION: TOWNSHIP:

SHEET: **1 of 1**  
RANGE:

CLIENT: ST. JOHNS RIVER STATE COLLEGE

G.S. ELEVATION (ft):

DATE STARTED: 10/3/19

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 8.9

DATE FINISHED: 10/3/19

REMARKS:

DATE OF READING: 10/4/19

DRILLED BY: DB/DH

EST. W.S.W.T. (ft):

TYPE OF SAMPLING: ASTM D 1586

DEPTH (FT.)	S A M P L E	BLOWS PER 6" INCREMENT	N (BLOWS/ FT.)	W.T.	S Y M B O L	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT./ DAY)	ORG. CONT. (%)
									LL	PI		
0						Light brown fine SAND (SP)						
5												
7-6-6		12				Medium dense grayish-brown fine SAND (SP)						
6-7-8		15		▼								
7-9-9		18										
10												
15						Loose dark grayish-brown fine SAND (SP)	2.0	29.2				
2-2-2		4										
20						Medium dense reddish-brown to brown fine SAND (SP)	3.2	33.2				
5-8-8		16										
25							2.1	28.1				
8-9-11		20										

BORING LOG: 0930.1900181.0000-LIBRARY BUILDING ADDITION.GPJ UNIENGGSC.GDT 10/23/19



**SYMBOLS AND ABBREVIATIONS**

<u>SYMBOL</u>	<u>DESCRIPTION</u>
N-Value	No. of Blows of a 140-lb. Weight Falling 30 Inches Required to Drive a Standard Spoon 1 Foot
WOR	Weight of Drill Rods
WOH	Weight of Drill Rods and Hammer
	Sample from Auger Cuttings
	Standard Penetration Test Sample
	Thin-wall Shelby Tube Sample (Undisturbed Sampler Used)
% REC	Percent Core Recovery from Rock Core Drilling
RQD	Rock Quality Designation
	Stabilized Groundwater Level
	Seasonal High Groundwater Level (also referred to as the W.S.W.T.)
NE	Not Encountered
GNE	Groundwater Not Encountered
BT	Boring Terminated
-200 (%)	Fines Content or % Passing No. 200 Sieve
MC (%)	Moisture Content
LL	Liquid Limit (Atterberg Limits Test)
PI	Plasticity Index (Atterberg Limits Test)
K	Coefficient of Permeability
Org. Cont.	Organic Content
G.S. Elevation	Ground Surface Elevation

**UNIFIED SOIL CLASSIFICATION SYSTEM**

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS More than 50% retained on the No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW Well-graded gravels and gravel-sand mixtures, little or no fines
			GP Poorly graded gravels and gravel-sand mixtures, little or no fines
	GRAVELS WITH FINES		GM Silty gravels and gravel-sand-silt mixtures
			GC Clayey gravels and gravel-sand-clay mixtures
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS 5% or less passing No. 200 sieve	SW** Well-graded sands and gravelly sands, little or no fines
			SP** Poorly graded sands and gravelly sands, little or no fines
SANDS with 12% or more passing No. 200 sieve		SM** Silty sands, sand-silt mixtures	
FINE-GRAINED SOILS 50% or more passes the No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less		ML Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
			OL Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50%		MH Inorganic silts, micaceous or diamicaceous fine sands or silts, elastic silts
			CH Inorganic clays or clays of high plasticity, fat clays
			OH Organic clays of medium to high plasticity
			PT Peat, muck and other highly organic soils

\*Based on the material passing the 3-inch (75 mm) sieve

\*\* Use dual symbol (such as SP-SM and SP-SC) for soils with more than 5% but less than 12% passing the No. 200 sieve

**RELATIVE DENSITY**

(Sands and Gravels)

- Very loose – Less than 4 Blow/Foot
- Loose – 4 to 10 Blows/Foot
- Medium Dense – 11 to 30 Blows/Foot
- Dense – 31 to 50 Blows/Foot
- Very Dense – More than 50 Blows/Foot

**CONSISTENCY**

(Sils and Clays)

- Very Soft – Less than 2 Blows/Foot
- Soft – 2 to 4 Blows/Foot
- Firm – 5 to 8 Blows/Foot
- Stiff – 9 to 15 Blows/Foot
- Very Stiff – 16 to 30 Blows/Foot
- Hard – More than 30 Blows/Foot

**RELATIVE HARDNESS**

(Limestone)

- Soft – 100 Blows for more than 2 Inches
- Hard – 100 Blows for less than 2 Inches

**MODIFIERS**

**These modifiers Provide Our Estimate of the Amount of Minor Constituents (Silt or Clay Size Particles) in the Soil Sample**

- Trace – 5% or less
- With Silt or With Clay – 6% to 11%
- Silty or Clayey – 12% to 30%
- Very Silty or Very Clayey – 31% to 50%

**These Modifiers Provide Our Estimate of the Amount of Organic Components in the Soil Sample**

- Trace – Less than 3%
- Few – 3% to 4%
- Some – 5% to 8%
- Many – Greater than 8%

**These Modifiers Provide Our Estimate of the Amount of Other Components (Shell, Gravel, Etc.) in the Soil Sample**

- Trace – 5% or less
- Few – 6% to 12%
- Some – 13% to 30%
- Many – 31% to 50%

## **FIELD EXPLORATION PROCEDURES**

### **Auger Boring**

The auger boring was performed mechanically by the use of a continuous-flight auger attached to the drill rig and in general accordance with the latest revision of ASTM D 1452, "Soil Investigation and Sampling by Auger Borings". Representative samples of the soils brought to the ground surface by the augering process were placed in glass jars, sealed and transported to our laboratory where they were examined by our engineer to verify the driller's field classification.

### **Standard Penetration Test Boring**

The penetration boring was made in general accordance with the latest revision of ASTM D 1586, "Penetration Test and Split-Barrel Sampling of Soils". The boring was advanced by rotary drilling techniques using a circulating bentonite fluid for borehole flushing and stability. At 2 ½ to 5 foot intervals, the drilling tools were removed from the borehole and a split-barrel sampler inserted to the borehole bottom and driven 18 inches into the soil using a 140-pound hammer falling on the average 30 inches per hammer blow. The number of blows for the final 12 inches of penetration is termed the "penetration resistance, blow count, or N-value". This value is an index to several in-place geotechnical properties of the material tested, such as relative density and Young's Modulus.

After driving the sampler 18 inches (or less if in hard rock-like material), the sampler was retrieved from the borehole and representative samples of the material within the split-barrel were placed in glass jars and sealed. After completing the drilling operations, the samples for each boring were transported to our laboratory where they were examined by our engineer in order to verify the driller's field classification.

## **LABORATORY TESTING PROCEDURES**

### **Natural Moisture Content**

The water content of the sample tested was determined in general accordance with the latest revision of ASTM D 2216. The water content is defined as the ratio of “pore” or “free” water in a given mass of material to the mass of solid material particles.

### **Percent Fines Content**

The percent fines or material passing the No. 200 mesh sieve of the sample tested was determined in general accordance with the latest revision of ASTM D 1140. The percent fines are the soil particles in the silt and clay size range.

### **Atterberg Limits**

The Atterberg Limits consist of the Liquid Limit (LL) and the Plastic Limit (PL). The LL and PL were determined in general accordance with the latest revision of ASTM D 4318. The LL is the water content of the material denoting the boundary between the liquid and plastic states. The PL is the water content denoting the boundary between the plastic and semi-solid states. The Plasticity Index (PI) is the range of water content over which a soil behaves plastically and is denoted numerically by as the difference between the LL and the PL. The water content of the sample tested was determined in general accordance with the latest revision of ASTM D 2216. The water content is defined as the ratio of “pore” or “free” water in a given mass of material to the mass of solid material particles.



**APPENDIX B**

**IMPORTANT INFORMATION ABOUT THIS  
GEOTECHNICAL ENGINEERING REPORT**

**CONSTRAINTS AND RESTRICTIONS**

# Important Information about Your Geotechnical Engineering Report

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

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

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

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

## **Read the Full Report**

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

## **A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors**

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

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

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

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,

- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

## **Subsurface Conditions Can Change**

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

## **Most Geotechnical Findings Are Professional Opinions**

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

## **A Report's Recommendations Are *Not* Final**

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

### **A Geotechnical Engineering Report Is Subject to Misinterpretation**

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

### **Do Not Redraw the Engineer's Logs**

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

### **Give Contractors a Complete Report and Guidance**

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

### **Read Responsibility Provisions Closely**

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that

have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### **Geoenvironmental Concerns Are Not Covered**

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

### **Obtain Professional Assistance To Deal with Mold**

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

### **Rely on Your ASFE-Member Geotechnical Engineer for Additional Assistance**

Membership in ASFE/THE BEST PEOPLE ON EARTH exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

## **ASFE THE GEOPROFESSIONAL BUSINESS ASSOCIATION**

8811 Colesville Road/Suite G106, Silver Spring, MD 20910  
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# CONSTRAINTS & RESTRICTIONS

The intent of this document is to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.

## WARRANTY

Universal Engineering Sciences has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

## UNANTICIPATED SOIL CONDITIONS

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

## CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Universal Engineering Sciences, as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and Universal Engineering Sciences of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of Universal Engineering Sciences to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

## MISINTERPRETATION OF SOIL ENGINEERING REPORT

Universal Engineering Sciences is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data presented are made by others, those conclusions or recommendations are not the responsibility of Universal Engineering Sciences.

## CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by Universal Engineering Sciences.

## USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations.

Bidders are urged to make their own soil borings, test pits, test caissons or other investigations to determine those conditions that may affect construction operations. Universal Engineering Sciences cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

## STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

## OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

## WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicate normally occurring conditions. Water levels may not have been stabilized at the last reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions of variations.

## LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for Universal Engineering Sciences to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by Universal Engineering Sciences to locate any such buried objects. Universal Engineering Sciences cannot be responsible for any buried man-made objects which are subsequently encountered during construction that are not discussed within the text of this report.

## TIME

This report reflects the soil conditions at the time of exploration. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.



SECTION 00 41 13 – BID FORM – STIPULATED SUM

Place an "x" on the lines below of the documents attached to this form.

\_\_\_\_\_ Copy of license to do business in the State of Florida

\_\_\_\_\_ Section 00 43 31 – Trench Safety Certification

\_\_\_\_\_ Section 00 43 36 – List of Subcontractors

\_\_\_\_\_ Section 00 45 19 – Non-Collusion Affidavit

\_\_\_\_\_ Section 00 61 00 – Bid Bond Form or Cashier's Check

The undersigned Bidder hereby declares that the only person or persons interested in this proposal as Principal is named herein mentioned has any interest in this proposal or in the contract to be entered into; that this proposal is made without any connection with any person, company, or party submitting a proposal; and that it is in all respects fair and in good faith, without collusion or fraud.

The Bidder further declares that he has examined the site of the work and informed himself fully in regard to all conditions pertaining to the places where the work is to be done; that he has satisfied himself relative to the work to be performed and agrees to and by them.

---

NAME OF BIDDER

he Bidder proposes and agrees to provide all necessary materials, equipment, machinery, tools, apparatus, means of transportation, labor, and services necessary to complete the work for BID-SJR-03-2019 for St. Johns River State College.

Base Bid: \_\_\_\_\_ (\$ \_\_\_\_\_)

Bid Alternate 1: \_\_\_\_\_ (\$ \_\_\_\_\_)

Bid Alternate 2: \_\_\_\_\_ (\$ \_\_\_\_\_)

Unit Prices:

A. Unit Price "A"

1. Provide grout in existing masonry cells per Detail 5/S505 (\$ \_\_\_\_\_)

B. Unit Price "B"

1. Provide grout and rebar in existing masonry cells per Detail 6/S505 (\$ \_\_\_\_\_)

St. Johns River State College  
Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

The Bidder proposes and agrees hereby to commence the Work with an adequate force and equipment within seven (7) consecutive days after being notified by the Owner to do so, and shall carry on at a rate to secure Substantial completion as indicated in the Supplementary Instructions to Bidders.

The Bidder agrees that Liquidated Damages in the amount as indicated in the Supplementary Instructions to Bidders for each day the work remains incomplete, shall be assessed against him if the work is not completed within the above specified time limit.

Attached hereto is a Bid Bond in the sum of:

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

made payable to the Owner.

The following Addenda were received:

Addendum \_\_\_\_\_, Dated \_\_\_\_\_

Addendum \_\_\_\_\_, Dated \_\_\_\_\_

Addendum \_\_\_\_\_, Dated \_\_\_\_\_

Addendum \_\_\_\_\_, Dated \_\_\_\_\_

Addendum \_\_\_\_\_, Dated \_\_\_\_\_

Addendum \_\_\_\_\_, Dated \_\_\_\_\_

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

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

All companies certify by their signature that they have read and understand the conditions and specifications of the bid and have included all required documents, and that they have the authority, capacity, and capability to perform according to the conditions and specifications of BID-SJR-03-2019.

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

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

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

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

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

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

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

END OF SECTION 00 41 13

SECTION 00 43 36 – SUBCONTRACTORS LIST

DIVISION OF WORK	PROPOSED SUBCONTRACTOR	PRINCIPAL/OFFICER	CORP. ADDRESS	LICENSE NO.
DEMOLITION				
SITEWORK				
CONCRETE				
MASONRY				
STRUCTURAL STEEL				
CEMENT PLASTER				
GLAZING				
ROOFING				
FLOORING				
HVAC				
PLUMBING				
ELECTRICAL				
PAINTING				
DRYWALL				

SIGNED: \_\_\_\_\_ (BIDDER)





St. Johns River State College  
Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

SECTION 00 45 19 – NON-COLLUSION AFFIDAVIT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. St. Johns River State College Non-Collusion Affidavit is attached. This form must be copied, completed, notarized and submitted with the Contract Documents.

PART 2 – PRODUCTS *(Not Applicable)*

PART 3 – EXECUTION *(Not Applicable)*

END OF SECTION 00 45 19

NON-COLLUSION AFFIDAVIT

STATE OF \_\_\_\_\_

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

I state that I \_\_\_\_\_ of \_\_\_\_\_,  
(Name and Title) (Name of Firm)

am authorized to make this affidavit on behalf of my firm and its owner, directors and officers. I am the person responsible in my firm for the price(s) and amount(s) of this Response, and the preparation of the Response. I state that:

1. The price(s) and amount(s) of this Response have been arrived at independently and without consultation, communication or agreement with any other Provider, potential provider, Proposal, or potential Proposal.
2. Neither the price(s) nor the amount(s) of this Response, and neither the approximate price(s) nor approximate amounts(s) of this Response, have been disclosed to any other firm or person who is a Provider, potential Provider, Proposal, or potential Proposal, and they will not be disclosed before Proposal opening.
3. No attempt has been made or will be made to induce any firm or persons to refrain from submitting a Response for this contract, or to submit a price(s) higher than the prices in this Response, or to submit any intentionally high or noncompetitive price(s) or other form of complementary Response.
4. The Response of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive Response.
5. \_\_\_\_\_, its affiliates, subsidiaries, officers, director, and (Name of Firm) employees are not currently under investigation, by any governmental agency and have not in the last three years been convicted or found liable for any act prohibited by State or Federal Law in any jurisdiction, involving conspiracy or collusion with respect to Proposal, on any public contract, except as follows:

I state that I and the named firm understand and acknowledge that the above representations are material and important, and will be relied on by the State of Florida for which this Response is submitted. I understand and my firm understands that any misstatement in this affidavit is, ad shall be treated as, fraudulent concealment from the State of Florida of the true facts relating to the submission of responses for this contract.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Name of Organization: \_\_\_\_\_

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

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

Being duly sworn deposes and says that the information herein is true and sufficiently complete so as not to be misleading. Subscribed and sworn before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

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

My Commission Expires: \_\_\_\_\_

END OF SECTION 00 45 19

# DRAFT AIA® 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 « »  
(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.

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.

**ELECTRONIC COPYING** of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

## TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

### 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.)

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

[ « » ] By the following date: « »

§ 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 « » day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the « » day of the « » 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 « » ( « » ) 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:

<< >>

## § 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.)*

**§ 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:**

« »

**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
- .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 Drawings**

Number	Title	Date

**.6 Specifications**

Section	Title	Date	Pages

**.7 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.

**.8 Other Exhibits:**

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

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

<< >>

[ << >> ] The Sustainability Plan:

Title	Date	Pages

[ << >> ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

9 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)

<< >><< >>

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

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

<< >><< >>

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

# DRAFT AIA® Document A201™ – 2017

## General Conditions of the Contract for Construction

for the following PROJECT:

*(Name and location or address)*

<< >>  
<< >>

THE OWNER:

*(Name, legal status and address)*

<< >>< >>  
<< >>

THE ARCHITECT:

*(Name, legal status and address)*

<< >>< >>  
<< >>

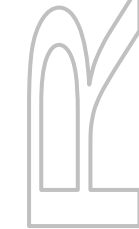
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**ADDITIONS AND DELETIONS:**  
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information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

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

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



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## **ARTICLE 1 GENERAL PROVISIONS**

### **§ 1.1 Basic Definitions**

#### **§ 1.1.1 The Contract Documents**

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

#### **§ 1.1.2 The Contract**

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

#### **§ 1.1.3 The Work**

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

#### **§ 1.1.4 The Project**

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

#### **§ 1.1.5 The Drawings**

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

#### **§ 1.1.6 The Specifications**

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

#### **§ 1.1.7 Instruments of Service**

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

#### **§ 1.1.8 Initial Decision Maker**

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

### **§ 1.2 Correlation and Intent of the Contract Documents**

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

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

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

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

### § 1.3 Capitalization

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

### § 1.4 Interpretation

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

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

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

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

### § 1.6 Notice

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

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

### § 1.7 Digital Data Use and Transmission

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

### § 1.8 Building Information Models Use and Reliance

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

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

## **ARTICLE 2 OWNER**

### **§ 2.1 General**

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

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

### **§ 2.2 Evidence of the Owner's Financial Arrangements**

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

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

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

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

### **§ 2.3 Information and Services Required of the Owner**

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

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

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

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

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

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

#### § 2.4 Owner's Right to Stop the Work

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

#### § 2.5 Owner's Right to Carry Out the Work

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

### ARTICLE 3 CONTRACTOR

#### § 3.1 General

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

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

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

#### § 3.2 Review of Contract Documents and Field Conditions by Contractor

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as



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

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

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

### **§ 3.3 Supervision and Construction Procedures**

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

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

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

### **§ 3.4 Labor and Materials**

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

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

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

### **§ 3.5 Warranty**

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

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

### **§ 3.6 Taxes**

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

### **§ 3.7 Permits, Fees, Notices and Compliance with Laws**

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

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

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

### **§ 3.7.4 Concealed or Unknown Conditions**

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

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



### § 3.8 Allowances

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

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

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

### § 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

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

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

### § 3.10 Contractor's Construction and Submittal Schedules

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

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

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

### § 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and

similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

### § 3.12 Shop Drawings, Product Data and Samples

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

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

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

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

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

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

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

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

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

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

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

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

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

### **§ 3.13 Use of Site**

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

### **§ 3.14 Cutting and Patching**

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

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

### **§ 3.15 Cleaning Up**

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

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

### **§ 3.16 Access to Work**

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

### **§ 3.17 Royalties, Patents and Copyrights**

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

### **§ 3.18 Indemnification**

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

**§ 3.18.2** In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

## **ARTICLE 4 ARCHITECT**

### **§ 4.1 General**

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

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

### **§ 4.2 Administration of the Contract**

**§ 4.2.1** The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

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

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

### **§ 4.2.4 Communications**

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

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

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

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

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

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

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

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

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

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

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

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in



number and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a Separate Contractor or the subcontractors of a Separate Contractor.

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

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

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

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

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

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

## § 5.3 Subcontractual Relations

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

## § 5.4 Contingent Assignment of Subcontracts

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

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

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

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

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

## **ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS**

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

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

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

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

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

### **§ 6.2 Mutual Responsibility**

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

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

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

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

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

### § 6.3 Owner's Right to Clean Up

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

## ARTICLE 7 CHANGES IN THE WORK

### § 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

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

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

### § 7.2 Change Orders

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

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

### § 7.3 Construction Change Directives

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

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

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

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

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

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;



- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

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

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

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

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

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

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

#### § 7.4 Minor Changes in the Work

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

### ARTICLE 8 TIME

#### § 8.1 Definitions

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

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

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

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

## § 8.2 Progress and Completion

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

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

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

## § 8.3 Delays and Extensions of Time

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

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

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

## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 Contract Sum

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

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

### § 9.2 Schedule of Values

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

### § 9.3 Applications for Payment

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

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

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

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

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

#### § 9.4 Certificates for Payment

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

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

#### § 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

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

.7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

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

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

#### § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

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

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

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

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

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

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

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

## § 9.7 Failure of Payment

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

## § 9.8 Substantial Completion

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

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

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

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

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

## § 9.9 Partial Occupancy or Use

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

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

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



## § 9.10 Final Completion and Final Payment

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

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

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

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

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

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

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### § 10.1 Safety Precautions and Programs

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

### § 10.2 Safety of Persons and Property

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

- .1 employees on the Work and other persons who may be affected thereby;

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

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

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

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

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

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

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

#### § 10.2.8 Injury or Damage to Person or Property

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

#### § 10.3 Hazardous Materials and Substances

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

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed

by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

**§ 10.3.3** To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

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

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

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

#### **§ 10.4 Emergencies**

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

### **ARTICLE 11 INSURANCE AND BONDS**

#### **§ 11.1 Contractor's Insurance and Bonds**

**§ 11.1.1** The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

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

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

**§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the



procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

## **§ 11.2 Owner's Insurance**

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

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

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

## **§ 11.3 Waivers of Subrogation**

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

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

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

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

#### **§11.5 Adjustment and Settlement of Insured Loss**

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

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

### **ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

#### **§ 12.1 Uncovering of Work**

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

**§ 12.1.2** If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

#### **§ 12.2 Correction of Work**

##### **§ 12.2.1 Before Substantial Completion**

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

##### **§ 12.2.2 After Substantial Completion**

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

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

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

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

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

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

### § 12.3 Acceptance of Nonconforming Work

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

## ARTICLE 13 MISCELLANEOUS PROVISIONS

### § 13.1 Governing Law

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

### § 13.2 Successors and Assigns

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

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

### § 13.3 Rights and Remedies

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

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

### § 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect

timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

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

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

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

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

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

### § 13.5 Interest

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

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 Termination by the Contractor

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

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

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

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract

Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

#### **§ 14.2 Termination by the Owner for Cause**

**§ 14.2.1** The Owner may terminate the Contract if the Contractor

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

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

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

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

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

#### **§ 14.3 Suspension by the Owner for Convenience**

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

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

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

#### **§ 14.4 Termination by the Owner for Convenience**

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

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

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

**§ 14.4.3** In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work



properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

## **ARTICLE 15 CLAIMS AND DISPUTES**

### **§ 15.1 Claims**

#### **§ 15.1.1 Definition**

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

#### **§ 15.1.2 Time Limits on Claims**

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

#### **§ 15.1.3 Notice of Claims**

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

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

#### **§ 15.1.4 Continuing Contract Performance**

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

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

#### **§ 15.1.5 Claims for Additional Cost**

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

#### **§ 15.1.6 Claims for Additional Time**

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

**§ 15.1.6.2** If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

#### **§ 15.1.7 Waiver of Claims for Consequential Damages**

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

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

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

## **§ 15.2 Initial Decision**

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

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

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

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

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

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

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

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

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

### § 15.3 Mediation

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

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

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

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

### § 15.4 Arbitration

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

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

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

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

### § 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party



provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

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

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





## SECTION 00 54 22 – UNIT PRICES SCHEDULES

### 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 unit prices.

#### 1.3 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

#### 1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, protection from the elements, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work quantified by the Architect and the final determination will be made by the Architect.
- D. List of Unit Prices: A schedule of unit prices is included in Part 1.5. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.
- E. Unit prices shall be listed in Bid Proposal Form.

#### 1.5 SCHEDULE OF UNIT PRICES

- A. Unit Price "A"
  - 1. Provide grout in existing masonry cells per Detail 5/S505
- B. Unit Price "B"
  - 1. Provide grout and rebar in existing masonry cells per Detail 6/S505

END OF SECTION 00 54 22



St. Johns River State College  
Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

SECTION 00 61 00 – BID BOND FORM

BID BOND FORM

AIA Document A310, Bid Bond, February, 2010, is the form to be used.

AIA Document A310 may be purchased from the Florida Association of the American Institute of Architects, (AIA Florida), 104 East Jefferson Street, Tallahassee, Florida, telephone: 904-222-7590, fax: 904-224-8048, or may be examined at the Architect's office.

END OF SECTION 00 61 00



SECTION 00 62 00 – BONDS AND CERTIFICATES

PART 1 – GENERAL

1.1 PERFORMANCE BOND AND LABOR & MATERIAL PAYMENT BOND

- A. AIA Document A312 Performance and Payment Bond, 2010 Edition is the form of to be used for this Work.
- B. AIA Document A312 may be purchased from the Florida Association of the American Institute of Architects, (AIA Florida), 104 East Jefferson Street, Tallahassee, Florida, tel: 904-222-7590, fax: 904-224-8048, or may be examined at the Architect's office.

1.2 BONDS SPECIFIED ELSEWHERE

- A. See ALL Divisions for other bonds, warranties, etc., that may be required.

1.3 CERTIFICATE OF INSURANCE

- A. Contractor shall provide all relevant certificates of insurance.

END OF SECTION 00 62 00





## SECTION 00 73 00 – SUPPLEMENTARY CONDITIONS OF THE CONTRACT

### INTRODUCTORY PARAGRAPH

The following supplements, modify, change, delete from or add to the General Conditions of the Contract for Construction, AIA Document A201, 2017. Where a portion of the General Conditions is modified or deleted by these supplements, the unaltered portions of the General Conditions shall remain in effect.

### ARTICLE 1 GENERAL PROVISIONS

#### 1.1.3 THE WORK

Add the following sentence to the end of Paragraph 1.1.3

The term “furnish” includes purchase and delivery to Project Site. The term “install” includes receiving, unloading and storing at Project Site, installing in place, and placing in operation or finishing complete for intended use. The term “provide” includes furnishing and installing.

#### 1.1.9 MISCELLANEOUS DEFINITIONS

1.1.9.1 The term “provide” as used in the Project Manual means to furnish and install, complete and ready for intended use.

1.1.9.2 The term “product” as used in the Project Manual includes materials, fabrications, systems and equipment.

#### 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following subparagraphs to Paragraph 1.2

1.2.4 Should the Drawings and Specifications conflict at any point, the work is to be done according to the Specifications insofar as the quality of materials and workmanship is concerned; but the Drawings shall govern insofar as the form or extent of the work is concerned. Should details and schedules shown on drawings conflict on any point, the schedules prevail. Large-scale details prevail over small-scale plans and elevations, and figure dimensions over scaled dimensions. AIA General Conditions, Addenda and Change Orders supersede the portions of the Documents.

1.2.5 The Drawings are intended to show the general arrangements, design and extent of the Work, and are partly diagrammatic; they are not intended to be called for rough-in measurements, or to serve as Shop Drawings. In general, the better quality or greater quantity of Work or materials shall be furnished unless otherwise indicated in Writing by the Architect.

1.2.6 Where a typical or representative detail is shown on the Drawings, this detail shall constitute the standard in workmanship and materials throughout corresponding parts of the Work; adaptation, however, shall be subject to the approval of the Architect.

#### 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS, AND THEIR INSTRUMENTS OF SERVICE

Add the following paragraphs to 1.5

1.5.3 Contractor’s Use of Instruments of Service in Electronic Form

- .1 The Architect may, with the concurrence of the Owner, furnish to the Contractor versions of Instruments of Service in electronic form. The Contract Documents executed or identified in accordance with Subparagraph 1.5.1 shall prevail in case of an inconsistency with subsequent versions made through manipulatable electronic operations involving computers.
- .2 The Contractor shall not transfer or reuse Instruments of Service in electronic or machine readable form without prior written consent of the Architect.

Add 1.5.4 Upon award of the Contract, the Architect will furnish to the Contractor without charge, five (5) sets of Contract Drawings, Specifications and Addenda. The Contractor may obtain additional sets of the above from the Architect, at the cost of printing and handling.

## ARTICLE 2 OWNER

Add Paragraph 2.3.4.1:

As it relates to sanitary sewer and water utility services, the Owner shall pay any applicable capital facilities fees or front footage fees, tap fees, water meters, or other required equipment items related to services provided by the utility entity.

## ARTICLE 3 CONTRACTOR

### 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

Add the following Clause after Subparagraph 3.2.1

3.2.1.1 Contractor shall ascertain the location of all existing utilities prior to beginning new and alteration work.

Verify locations of utility lines shown on Drawings; locate and mark each utility prior to start of construction. Any damage caused to any utility as a result of Work on this Project shall be promptly repaired or replaced at the sole expense of the Contractor and no additional money will be paid by the Owner.

Add the following Subparagraph 3.2.5 to paragraph 3.2

3.2.5 The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for the Architect to evaluate and respond to the Contractor's requests for information, where such information was available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, or other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

Add the following Subparagraph 3.2.6

3.2.6 Claims for additional compensation or extensions of time because of the failure of the Contractor to field verify proposed and existing Work will not be allowed.

### 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following after Subparagraph 3.3.1

- .1 The Contractor shall review, verify, and be in agreement with any specified construction or installation procedure and installation prior to performing the Work, including

manufacturers recommended and referenced standards, and shall report to the Architect at once if the specified procedure and instruction (1) does not appear to follow reasonable construction practice, (2) may invalidate any specific warranty or general Contractor's warranty, or (3) may be objectionable to the Contractor for some reason.

3.3.1.2 In conjunction with reporting an objection, the Contractor shall propose, in writing, alternative procedures to which the Contractor will agree and warrant.

### 3.4 LABOR AND MATERIALS

Delete Subparagraph 3.4.2 and add the following:

3.4.2 After the Contract has been executed, the Owner and Architect will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 1 of the Specifications). By making requests for substitutions, the Contractor:

- .1 represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.
- .2 represents that the Contractor will provide the same warranty for the substitutions that the Contractor would for that specified.
- .3 certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's re-design costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and
- .4 will coordinate installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

Add the following to Subparagraph 3.4.3

Should the Architect or Owner find any person(s) employed on the project to be incompetent, unfit, or otherwise objectionable for his duties, the Contractor shall immediately cause the employee to be dismissed and said employee shall not be re-employed on this project without the written consent of the Architect and the Owner.

Add the following Subparagraph 3.4.4 to Paragraph 3.4

3.4.4 The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect to evaluate the Contractor's proposed substitutions and to make agreed-upon changes in the Drawings and Specifications made necessary by the Owner's acceptance of such substitutions.

After Paragraph 3.4.4, add the following new paragraph 3.4.5:

3.4.5 The Owner will require of the Contractor that, to the fullest extent possible, preference in the employment of all skilled and unskilled labor, other than the Contractor's key personnel, be given to residents of Putnam, St. Johns and Clay counties when such labor is available and qualified to do the type of work required.

### 3.5 WARRANTY

After paragraph 3.5, add the following new Subparagraph 3.5.1:

3.5.1 Specific and special warranties specified are in addition to and not in lieu of the Contractor's general warranty.

### 3.6 TAXES

Add the following to Paragraph 3.6

- 3.6.1 Contractor shall pay unemployment and Social Security taxes and other taxes imposed by Local, City, State, or Federal government and certify to Owner that this has been done before final payment is made to Contractor.
- 3.6.2 SJR State reserves the right to implement a sales tax savings program by selecting certain items for Direct Purchase. See Article 16.6 of these Supplementary Conditions.

### 3.7 PERMITS, FEES AND NOTICES

Delete Subparagraph 3.7.1 and substitute the following:

- 3.7.1 The Contractor shall secure and pay for the building permit. The cost of the building permit shall not be included with the bid price proposal submitted by Contractor. Contractor will be reimbursed for cost of building permit upon providing Owner with documentation of permit obtained and payment to College's permitting entity. Contractor shall secure and pay for all other permits, governmental fees, licenses, and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded.

Add the following Clause 3.7.1.1 to Subparagraph 3.7.1

- 3.7.1.1 Architect shall provide copies of Change Orders to the Building Official.

### 3.9 SUPERINTENDENT

Add the following Subparagraph 3.9.4 to Paragraph 3.9

- 3.9.4 The Contractor shall employ a superintendent or an assistant to the superintendent who will perform as coordinator for the mechanical and electrical work. The coordinator shall be knowledgeable in mechanical and electrical systems and capable of reading, interpreting and coordinating Drawings, Specifications, and Shop Drawings pertaining to such systems. The coordinator shall assist the Subcontractors in arranging space conditions to eliminate interference between the mechanical and electrical systems and other work, and shall supervise the preparation of coordination drawings documenting the spatial arrangements for such systems within restricted spaces. The coordinator shall assist in planning and expediting the proper sequence of delivery of mechanical and electrical equipment to the site.

### 3.12 SHOP DRAWINGS< PRODUCT DATA AND SAMPLES

Add the following Subparagraph 3.12.11 to Paragraph 3.12

- 3.12.11 The Architect's review of the Contractor's submittals will be limited to examination of an initial submittal and two (2) re-submittals. The Architect's review of additional submittals will be made only with the consent of the Owner after notification by the Architect. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for evaluation of such additional re-submittals.

### 3.13 USE OF SITE

Add the following Subparagraph 3.12.3 to Paragraph 3.13

3.13.2 The Contractor shall confine his equipment, storage of materials, and operations of his workmen to limits directed by the Architect. Materials shall not be brought onto the site until reasonably required for the progress of the Work. Storage space will be confined to a designated area of the site. When the site is not in a condition to receive a material shipment, the Contractor shall have materials properly stored elsewhere at no additional cost to the Owner. No payment for materials shall be made unless material is stored on site.

3.13.3 Material shall be arranged and maintained in an orderly manner with use of walks, drives, roads and entrances unencumbered. Store, place and handle material and equipment delivered to project site so as to preclude inclusion of foreign substances or causing discoloration. Pile neatly and completely and barricade to protect public from injury. Protect material as required to prevent damage from ground or weather. Should it be necessary to move material at any time, or move sheds or storage platforms, Contractor shall move them as and when required at no additional cost to the Owner. The Owner assumes no responsibility for stored materials in building or on site. The Contractor shall assume full responsibility for damage due to storing of materials. Repairing of areas used for the placing of sheds, offices, and storage of materials shall be done by the Contractor.

#### 3.14 CUTTING AND PATCHING

After paragraph and the following new paragraph 3.14.3:

3.14.3 Existing structures and facilities, including but not limited to buildings, utilities, topography, streets, curbs, sidewalks, landscape materials and other improvements that are damaged or removed due to Contractor's work, shall be patched, repaired, or replaced by the Contractor to the satisfaction of the Architect and authorities having jurisdiction. In the event that local authorities having jurisdiction require that such repairing and patching be done with their own labor and materials, the Contractor shall abide by such regulations and pay for such work.

### ARTICLE 4 ARCHITECT

#### 4.2 ADMINISTRATION OF THE CONTRACT

Paragraph 4.2.3, at the end of this paragraph, add the following new text:

If on-site inspections and observations disclose defects and deficiencies, or work not being carried **out in accordance with the Contract Documents, the Architect shall request the Contractor to correct such deficiencies.** If the Contractor fails to take corrective action within a reasonable time, the Architect will notify the Owner in writing with a copy of such notice to the Contractor, calling the Owner's attention to the Contractor's failures to carry out the provisions of the Contract.

At the end of Paragraph 4.2.13, add the following new text to the end of the last sentence:

And, if and when approved by the Owner.

Add the following Clause after Subparagraph 4.2.4:

4.2.4.1 Any direct communication between the Owner and Contractor which may affect the administration or performance of the Contract shall be made or confirmed in writing, with copies to the Architect.

## ARTICLE 5 SUBCONTRACTORS

### 5.2 THE AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

In the first sentence of Subparagraph 5.2.1 change the phrase "...as soon as practicable..." to read "...within 10 days..."

## ARTICLE 6 CONSTRUCTION BY OWNER OR SEPARATE CONTRACTORS

6.2.6 Claims, disputes and other matters in question between the Contractor and a separate contractor shall be subject to the provisions of Paragraph 4.3, provided the separate contractor has reciprocal obligations. If such separate contractor sues the Owner on account of damages alleged to have been sustained, the Owner shall have the option of defending such proceeding or of notifying the Contractor who shall defend such proceeding and shall pay all costs in connection therewith; and if any judgment against the Owner arises therefrom, the Contractor shall pay or satisfy it, together with the Owner's reasonable costs, including attorney's fees and court costs.

Add the following Subparagraphs to Paragraph 6.2

6.2.7 Project meetings will be held at times designated by the Architect after conference with the Contractor. Contractor and designated Subcontractors must attend these meetings. If the principal of the firm does not attend meetings, the individual representing the firm must be a responsible representative of the company who can bind the company to a decision at the meeting.

## ARTICLE 7 CHANGES IN THE WORK

### 7.1 GENERAL

Add the following to Paragraph 7.1.3

"The cost of all changes in the Work shall be substantiated by complete itemized statements showing quantities and unit prices for all material, labor (including all fringe benefits), equipment and other items of cost. Cost of labor (including applicable fringe benefits) and materials shall be actual costs to the Contractor. The Contractor shall submit receipts or other evidences, as the Architect may direct, showing his actual costs and his rights to the payment claims."

Add the following Paragraph 7.1.4 and Clauses to Paragraph 7.1

7.1.4 In the maximum percentage of profit and overhead which may be added to actual costs of changes in the Work shall be as follows:

- .1 For Work done by his own organization, the Contractor may add ten percent (10%) of his actual costs.
- .2 For Work done by Subcontractors, the respective Subcontractor may add ten percent (10%) of their costs and the Contractor and add ten percent (10%) of the above Subcontractor's total
- .3 Overhead shall include the following: Supervision, wages or time-keepers, watchmen and clerks, hand tools, incidentals, general office expense, and all other expenses not included in "cost".
- .4 Authorizations for changes in the Work shall be made in writing to the Architect and the Owner, and no claim for the revision of the Contract Sum shall be valid unless so authorized.

### 7.3 CONSTRUCTION CHANGE DIRECTIVES

Paragraph 7.3.7 Delete the first sentence and replace with the following new first sentence:

"If the Contractor does not respond promptly, i.e. within 14 calendar days, or disagrees with the method for adjustment in the Contract Sum, the method and adjustment shall be determined by the Architect on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an allowance for overhead and profit in accordance with the Contract Specifications. Should the response take longer than 14 calendar days, a written explanation of why more time is required must be submitted to the architect."

Paragraph 7.3.7, at the end of this paragraph add the following text

Cost shall not include any of the following:

- .6 Salaries or other compensation of the Contractor's personnel at the Contractor's office unless direct additional expenses have been incurred exclusively because of the change;
- .7 Expenses of the Contractor's offices, including the field office;
- .8 Any part of the Contractor's capital expenses, including interest on the Contractor's capital;
- .9 Costs due to the negligence of the Contractor, or any Subcontractor
- .10 Overhead, general expense, and the cost of any item not specifically or reasonably inferable as included in the items described in 7.3.6.1 through 7.3.6.5

### ARTICLE 8 TIME

Add the following Subparagraphs to Paragraph 8.2

- 8.2.4 The Contractor shall furnish sufficient forces, construction plant and equipment, and shall work such hours, including night shifts and overtime operations, as may be necessary to ensure prosecution of the work in accordance with the approved progress schedule. If the Contractor falls behind the progress schedule, he shall take such steps as may be necessary or as may be directed by the Architect to improve his progress by increasing the number of shifts, overtime operations, days of work, and the amount of construction plant, as may be required, at no additional cost to the Owner.
- 8.2.5 Failure of the Contractor to comply with the requirements under this provision shall be grounds for determination that the Contractor is not prosecuting the work with such diligence as will ensure completion within the time specified and such failure constitutes a substantial violation of the conditions of the Agreement.
- 8.2.6 Upon such determination, the Owner may terminate the Contractor's right to proceed with the work, or any separate part thereof, in accordance with Paragraph 14.2.
- 8.2.7 Failure to complete the project within the time fixed in the Agreement will result in substantial injury to the Owner, and damages arising from such failure cannot be calculated with any degree of certainty; therefore, if the project is not substantially completed within the time fixed in the Agreement, or within such further time, if any, as shall be allowed for substantial completion, the Contractor shall pay to the Owner liquidated damages for such delay for each and every calendar day elapsing between the date fixed for substantial completion and the date such substantial completion shall have been fully accomplished in accordance with the following:

SCHEDULE OF LIQUIDATED DAMAGES:

One Thousand Dollars (\$1,000.00) per calendar day.

8.2.8 Provision for assessment of liquidated damages for delay in no manner affect the Owner's right to terminate the Contract as provided in Article 14 of the General Conditions or elsewhere in the Contract Documents. The Owner's exercise of the right to terminate shall not release the Contractor from his obligation to pay said liquidated damages in the amounts set out in the Agreement.

8.2.9 The Owner may deduct from the balance retained by the Owner under the provisions of Paragraph 9.4.3 any liquidated damages which may have occurred of such portion thereof as the said balance will cover.

ARTICLE 9 PAYMENTS AND COMPLETION

Add the following after Subparagraph 9.1.1

9.1.2 In conformance with the requirements of Section 725.06, Florida Statutes, the specific considerations for the Contractor's promises are:

9.1.2.1 One dollar (\$1.00) in hand paid by the Owner, the Architect and the Architect's employees to the Contractor, receipt whereof is hereby acknowledged and adequacy of which the Contractor accepts as completely fulfilling the obligations of the Owner, the Architect and the Architect's employees under the requirements of Section 725.06, Florida Statutes, and;

9.1.1.2 The entry of the Owner and the Contractor into the construction contract because, but not for the Contractor's promises as contained in the Contract Documents, the Owner would not have entered into the construction contract with the Contractor.

9.3 APPLICATION FOR PAYMENT

Add the following Clause to Subparagraph 9.3.1:

9.3.1.3 Until Substantial Completion, the Owner will pay ninety percent (90%) of the amount due the Contractor on account of progress payments, except that at 50% completion of the project, the Owner will pay ninety-five percent (95%) of the amount due the Contractor on account of progress payments.

In Subparagraph 9.3.3, change the first sentence to read:

"The Contractor warrants that title to all work and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon receipt of payment by the Contractor."

In the second sentence of Subparagraph 9.3.3, delete the words, "to the best of the Contractor's knowledge and belief."

9.4 CERTIFICATES FOR PAYMENT

Add the following to Subparagraph 9.4

9.4.3 Ten percent (10%) of each payment will be retained until the Contract, including Change Orders, is fifty percent (50%) complete, after which five percent (5%) will be retained until the project is substantially complete.



## 9.6 PROGRESS PAYMENTS

In the first line of Subparagraph 9.6.3, change the words "The Architect will, upon request..." to read, "The Architect may, on request and at his discretion..."

## 9.8 SUBSTANTIAL COMPLETION

Add the following Clause 9.8.3.1 to Subparagraph 9.8.3

9.8.3.1 Except with the consent of the Owner, the Architect will perform no more than two (2) inspections to determine whether the Work, or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional inspections

9.8.5 Delete the second sentence and substitute the following:

"Upon such acceptance and consent of surety, if any, the Owner shall make payment sufficient to increase the total payments to ninety-five percent (95%) of the Contract Sum, less such amounts as the Architect shall determine for incomplete work and unsettled claims."

## 9.10 FINAL COMPLETION AND FINAL PAYMENT

Add the following Clause to Subparagraph 9.10.1:

- .1 Except with the consent of the Owner, the Architect will perform no more than two (2) inspections to determine whether the Work, or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional inspections.

Add the following Subparagraph to Paragraph 9.10

9.10.6 Final payment shall be made to the Contractor as provided by the Agreement between the Owner and Contractor. Application for final payment shall be in the same form as application for progress payments as described in Paragraph 9.3.1 and shall be accompanied by the following additional items:

- .1 Completed and notarized waivers and releases of lien in a form acceptable to the Architect and Owner (refer to attached Waiver of Lien Certificate).
- .2 Certificates of Inspection and Occupancy as required by law
- .3 Such other data and substantiating information as may be required elsewhere in these Contract Documents including, but not limited to, all required guarantees, warranties, operating and maintenance manuals, As-Built drawings, or as may be required by the Owner or Architect and as described in DIVISION 1, SECTION 1770, CLOSEOUT PROCEDURE

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

Add the following after Article 10.4:

### 10.5 FLORIDA TRENCH SAFETY ACT

10.5.1 The Occupational Safety and Health Administration excavation safety standards, 29CFR 1926.650 Subpart B trench safety standards are in effect during the period of construction of the Project. In compliance with current State of Florida statutes, the Contractor or subcontractor performing trench excavation work on the Project shall comply with the applicable trench safety standards

ARTICLE 11 INSURANCE AND BONDS

Article 11 of the AIA General Conditions as written is deleted in its entirety and is superseded as follows:

11.1 Definitions:

11.1.1 Contractor: As used in this Article 11, is the Contractor and any and all of his Subcontractors, employees, agents and representatives

11.2 Builder's Risk Insurance: Owner shall purchase, maintain, and pay for the costs of Builder's Risk Insurance (fire, extended coverage, vandalism, theft, and malicious mischief) on all construction materials and the buildings or structures in the course of construction. Said Builder's Risk insurance shall insure to the benefit of Owner and Owner's interests. Contractor shall be responsible for the loss of, or damage to, any and all of the Contractor's personal property; such as tools, equipment, mobile office, etc.

11.2.1 Extended Coverage: The usual form currently available and covering perils of windstorm, hail, explosive, riot and civil commotion, damage from aircraft and vehicles and smoke damage

11.3 Liability Insurance: The Contractor will purchase and maintain during the entire time of this Agreement comprehensive general liability and comprehensive automobile liability insurance as shall protect him for property damages which may arise from operations under this Agreement whether such operations be by himself or by anyone directly or indirectly employed by him, and the amounts of such insurance shall be the minimum limits as follows:

11.3.1 Comprehensive General Liability including Personal Injury, Products Completed, Operations Coverage, Independent Contractor's Protective, and Contractual Liability

Bodily Injury and Property Damage:

\$1,000,000	Each Occurrence
\$5,000	Medical Payments (Any one person)
\$1,000,000	Personal and Adv. Injury
\$2,000,000	General Aggregate
\$2,000,000	Products – Comp/OP Aggregate

General Aggregate Limit applies per Product; Products – Comp/OP Aggregate applies per Project; Waiver of Subrogation in favor of Owner

Products and Completed Operations to be maintained for one (1) year after final payment

Property Damage Liability Insurance will provide X, C and U coverage when such contracts are affected. Owner shall be named as additional insured on all liability insurance.

11.3.2 Comprehensive Automobile Liability:

Combined Single Limit Each Accident	\$1,000,000 -or-
Bodily Injury per Person	\$1,000,000
Bodily Injury per Accident	\$2,000,000
Property Damage per Accident	\$1,000,000

Owner shall be named additional insured; Waiver of Subrogation in favor of Owner

11.3 Worker's Compensation Insurance: Contractor shall take out and maintain, during the life of this Agreement, Worker's Compensation Insurance in compliance with Chapter 440, Florida Statutes, for all of his employees connected with the work of this project and further, the Contractor shall require his Subcontractors similarly to provide Worker's Compensation Insurance. In case any class of employee engaged in hazardous work under this Contract at the site of the project is not protected under the Worker's Compensation Statute, the Contractor shall provide adequate insurance satisfactory to the Owner for the protection of his employees not otherwise protected

Required Limits:

1. Worker's Compensation – Statutory Benefits
  2. Employer's Liability
- |                           |                           |
|---------------------------|---------------------------|
| \$1,000,000 each employee | Bodily Injury by Accident |
| \$1,000,000 each employee | Bodily Injury by Disease  |
| \$1,000,000 policy limit  | Bodily Injury by Disease  |

Waiver of Subrogation in favor of Owner

11.4 Anything in the Contract Documents to the contrary notwithstanding and in addition to the insurance required to be maintained by the Contractor as hereinabove set forth, Contractor agrees to indemnify, hold harmless and defend Owner and Architect against any and all claims, loss, damage to or destruction of property including, without limitation, property and employees of Owner, occurring wholly or in part, as the result of work done or omitted to be done by, or contracted to be done but not done by, Contractor or his Subcontractors or the employees or agents or invites either arising from injury to or death of persons or damage to or destruction of property due or claimed to be due, in whole or in part, to any negligence or fault of Owner or its employees, agents, or invites, except claims, loss, damage, costs or expense resulting from risks as are hereinabove required to be insured by Owner.

11.5 Contractor shall submit to Owner before commencement of work, evidence of the above required insurance, which shall contain certification by the insurance companies that such insurance shall not be cancelled or materially changes until at least ten (10) days prior to written notification being given to the Owner. The Form of Certificate shall be the standard "Accord" form, Certificate of Insurance. The Contractor shall furnish the Owner copies of any endorsements that are subsequently issued amending coverage or limits

11.6 Anything in Paragraphs 4.18.1, 4.18.2, and 4.18.3 of the General Conditions to the contrary of the indemnification obligations hereby set forth shall not be applicable as between the Owner and Contractor, and any and all references to Owner therein deleted

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

Delete Paragraph 12.2.2 in its entirety and add the following:

12.2.2 If, after the approval of final payments and prior to expiration of one (1) year thereafter, or such longer period of time as may be prescribed by law or the terms of any applicable special guarantee required by the Contract Documents, any work is found to be defective, it shall be repaired by the Contractor. In case of an emergency, brought about by defective work of the Contractor, the Owner may proceed immediately to make the necessary corrections and charge the cost of same to the Contractor without giving any notice to the Contractor.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### 14.2 TERMINATION BY THE OWNER

Delete Paragraph 14.2.1 in its entirety and add the following:

14.2.1 If the Contractor is adjudged a bankrupt, or makes a general assignment for the benefit for the benefit of creditors, or if a receiver is appointed on account of the Contractor's insolvency, or if the Contractor persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or fails to make prompt payment to Subcontractors for materials or labor, or persistently disregards laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction, or if the Contractor:

1. Fails to correct, replace and/or re-execute faulty or defective work and/or materials furnished under this Agreement; or
2. Fails to complete or diligently proceed with the Work required by this Agreement, within the time constraints of the construction schedule maintained by the Architect; or
3. Fails to correct or repair any damage to Work caused by him or his failure to protect his Work or the Work of others; or
4. Fails to provide safe and sufficient facilities, orderly premises and the cleanup of the Work required under this Agreement; or
5. Is unable to proceed with the Work because of any action by one or more employees of the Trade Contractor or by a person or labor organization supporting or attempting to represent any employees of the Trade Contractor; or otherwise is guilty of a substantial violation of the provision of the Contract Documents, and fails within 72 hours after receipt of written notice to commence and continue correction of such default, neglect or violation with diligence and promptness, the Owner, upon certification by the Architect that sufficient cause exists to justify such action, may without prejudice to any other remedy the Owner may have, terminate the employment of the Contractor and take possession of the site and all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever methods the Owner deems expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished.

## ARTICLE 15 CLAIMS AND DISPUTES

Add the following to Paragraph 15.1.4

Unless otherwise provided in the Contract Documents, cost shall be limited to the following: cost of material at the trade discount cost, including sales tax and cost of delivery; cost of labor, including Social Security, unemployment insurance, and fringe benefits required by agreement or custom; Worker's Compensation Insurance, bond premium not to exceed one percent (1%); rental value of equipment and machinery at trade discount cost plus sales tax and the additional cost of supervision directly attributable to the change only if the change (or total time extension of all changes) results in an extension of the contract time for more than thirty (30) days. The bond premium of all credit amounts shall be added to the total credit allowed the Owner. No bond cost shall be allowed for a Subcontractor's bond cost.

Add the following Clauses to Subparagraph 15.1.5

15.1.5.3 Claims for an increase in Contract Time shall set forth in detail the circumstances that form the basis for the claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work, and the number of days increase in the Contract Time claimed as a consequence of each cause to delay. The Contractor shall provide such supporting documentation as the Owner may require

including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the claim.

15.1.5.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent delays due to the fault of the Contractor.

#### ARTICLE 16 – ADDITIONAL CONDITIONS (ADDED ARTICLE)

##### 16.1 MINIMUM WAGE (NOT REQUIRED)

##### 16.2 APPRENTICES AND TRAINEES

16.2.1 The Contractor shall conform to all requirements of Section 466.101 of the Florida Statutes with respect to apprentice and trainee employment

##### 16.3 EQUAL OPPORTUNITY

16.3.1 The Contractor and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, or age. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated fairly during employment without regard to their race, religion, color, sex, national origin, or age. Such action shall include, but not be limited to the following:

16.3.2 Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination in accordance with local, state and federal guidelines.

##### 16.4 PREFERENCE TO HOME INDUSTRIES

16.4.1 The Contractor agrees that, pursuant to Section §255.04, Florida Statutes, preferences will be given in the purchase of material and in the letting of contracts for the construction of this project to the residents of the State whenever such material can be purchased or services can be employed at no greater expense than that which could be obtained if such purchase was made or contract let to a person or firm doing business beyond the limits of the State, provided that quality of materials, qualifications, character, responsibility and fitness be equal.

##### 16.5 CODE REQUIREMENTS

16.5.1 All work under this Contract shall be completed with the Florida Building Code, 2014 Edition, and any/all subsequent addenda, as well as all local, County, State, and Federal laws, codes or requirements.

St. Johns River State College  
Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

**WAIVER OF LIEN AND CERTIFICATION**

St. Johns River State College  
Palatka, Florida

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

For and in consideration of \_\_\_\_\_ Dollars, and other good and valuable considerations, lawful money of the United States of America, to me in hand paid, the receipt whereof is hereby acknowledged, does hereby waive, release, remise and relinquish any and all right to claim any lien or liens for work done or material furnished, or any kind of class of lien whatsoever on the following described property:

DATED this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

at \_\_\_\_\_

\_\_\_\_\_.

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

Sworn to and Subscribed to me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_.

\_\_\_\_\_

NOTARY PUBLIC  
MY COMMISSION EXPIRES:

NOTARY SEAL

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

END OF SECTION 00 73 00

## SECTION 00 91 13 – ADDENDA AND MODIFICATIONS

### PART 1 – GENERAL

#### 1.1 ADDENDA

- A. Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which may modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections.
- B. Addenda prepared prior to issuance of the Project Manual are included or referenced at the end of this document.
- C. Addenda prepared after the issuance of the Project Manual should be added for reference at the end of this document.
- D. All addenda shall be acknowledged by the Bidder on the Bid Form.
- E. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification sections apply to this section.

#### 1.2 MODIFICATIONS

- A. See General Conditions, Article 1 for the complete definition of modifications
- B. Modifications, if inserted into the Project Manual, should be located at the end of this document.

### PART 2 – PRODUCTS *(Not Applicable)*

### PART 3 – EXECUTION *(Not Applicable)*

END OF SECTION 00 91 13





## SECTION 01 10 00 – SUMMARY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Project information.
  - 2. Work covered by Contract Documents.
  - 3. Owner-furnished products.
  - 4. Access to site.
  - 5. Work restrictions.
  - 6. Specification and drawing conventions.
  - 7. Miscellaneous provisions.

#### 1.3 PROJECT INFORMATION

- A. Project Identification: St. Johns River State College, Library Renovation and Addition – HJ Project No. 18064.00.
  - 1. Project Location: Orange Park Campus, Orange Park, Florida.
- B. Owner: St. Johns River State College, 5001 St. Johns Avenue, Palatka, Florida 32177.
  - 1. Owner's Representative:
    - a. Beverly J. Barker
    - b. Director of Capital Contract Management
    - c. St. Johns River State College
    - d. 5001 St. Johns Avenue, Palatka, Florida 32177
    - e. (386) 312-4110 (Office)
    - f. BeverlyBarker@sjrstate.edu
  - 2. For Facilities:
    - a. Tom Reynolds
    - b. Capital Construction Project Coordinator
    - c. Facilities Coordinator-Orange Park Campus
    - d. St. Johns River State College
    - e. 283 College Dr., Orange Park, Florida 32065
    - f. 904-276-6763/Fax 904-276-6769
    - g. TomReynolds@sjrstate.edu
- C. Architect: Harvard Jolly Architecture.

- D. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:
1. Civil Engineers: Hanson Professional Services, Inc., 8075 Gate Parkway West, Suite 204, Jacksonville, Florida 32216-3685.
  2. Structural/Mechanical/Electrical/Plumbing/Fire Protection/Communications Engineers: TLC Engineering Solutions, Inc., 874 Dixon Boulevard, Cocoa, Florida 32922.

#### 1.4 REQUIREMENTS

- A. The Owner/Contractor Contract shall take precedence over requirements indicated within the specifications.

#### 1.5 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
1. The project includes renovation of approximately 12,445 gsf of the existing MEDIA CENTER BUILDING 'L' into a new LIBRARY and adding approximately 5670 gsf as part of base bid for new WORK FORCE DEVELOPMENT, or 8415 gsf as part of Add Alternate 1 for new WORK FORCE DEVELOPMENT. The Library portion of the project will include areas for Reading, Collections, Group and Quiet Study, Writing Center, Library Instruction, Academic Support Center, Library Administration and Support spaces. Existing Building 'L' will be unoccupied during construction. The Work Force Development of the project will include areas for EMT Lab, Classrooms, Work Force Administration and Support spaces as part of base bid; and base bid scope plus areas for PT Lab as part of Add Alternate 1.
- B. Type of Contract:
1. Project will be constructed under a single prime contract.
- C. In the event of conflicts between the Construction Managers Contract with the Owner and requirements as stipulated in Division 01 Requirements the Construction Manager/Owner Contract shall govern.

#### 1.6 CONTRACTOR RESPONSIBILITIES

- A. Designate submittals and delivery date for each product.
- B. Review shop drawings, product data, samples, and other submittals. Submit to Architect with notification due to non-conformance with Contract Documents. Shop drawings that are not reviewed by the Contractor shall be returned.
- C. Receive and unload products at site
- D. Inspect deliveries, record shortages, and damaged or defective items and inform the Architect.

E. Coordination of Work

1. The General Contractor and Subcontractors shall review other sections of work applicable to their work and ascertain requirements in other sections applicable to their work. Each shall be held responsible for coordination and inclusion of the work indicated as it were in the particular subcontractor's section. The Architect shall be advised of any discrepancies or conflicts at the earliest moment.
2. All subcontractors, suppliers, etc., shall be responsible for knowing what information is given on all sheets of the plans and specifications concerning his particular work.
3. Paragraphs 1 and 2 shall be included in the Contractor-Subcontractor agreement.

F. Effect of Addenda, Amendments, Bulletins, Deletions, Omissions and Change Orders

1. No special implication, interpretation, in construction, connotation, denotation, import, or meaning shall be assigned to any provision of the Contract Documents because of changes created by the issuance of any (1) addendum, (2) amendment, (3) bulletin, (4) notice of other than the precise meaning that the contract documents would have had if the provision thus created had read originally as it reads subsequently to the (1) addendum, (2) amendment, (3) bulletin, (4) notice of deletion, (5) notice of omission, or (6) change order by which it was created.

G. Contract Forms and Requirements

1. Forms, requirements and documents included under Division 1 of this Project Manual together with the Table of Contents are a part of the Contract Documents.
2. Drawing sheets as identified on Index to Drawings are a part of the Contract Document
3. Documents, affidavits, and printed forms included in the Contract Documents are required by the Owner.
4. The requirement of Division 1 applies to all Divisions and Sections of the Project Manual as if reproduced therein.

1.7 DOCUMENT PRIORITIES

- A. Anything shown on the drawings and not mentioned in the specifications or mentioned in the specifications and not shown on the drawings shall have the same effect as if shown or mentioned respectively in both.
- B. Detail drawings take precedence over general drawings. Any work shown on one drawing shall be construed to be shown in all drawings and the Contractor will coordinate the work and the drawings.
- C. If any portion of the Contract Documents shall be in conflict with any other portion, the various documents comprising the Contract Documents shall govern in the following order of precedence:
  1. The Owner-Contractor Agreement
  2. Modifications
  3. Addenda
  4. Supplementary Conditions
  5. General Conditions
  6. Specifications
  7. Drawings
  8. Between schedules and information given on drawings, the schedules shall govern.
  9. Between figures given on drawings and the scaled measurements, the figures shall govern.

10. Between large-scale drawings and small-scale drawings, the larger scale shall govern.

- D. Any such conflict or inconsistency between or in the drawings shall be submitted to the Design Consultant whose decision thereon shall be final and conclusive.

#### 1.8 ENVIRONMENTAL GOALS

- A. The Owners has determined the project shall be constructed in accordance with Green Globe Ratings/Certification principals as provided for New Construction.
- B. The Owners goal is to conform to Green Globe Certification requirements but certification will not be required for this project.
- C. Support implementation of the School District's policy and programs for sustainable building.
1. Employ integrated design and construction.
  2. Optimize energy performance and energy efficiency.
  3. Protect and conserve water.
  4. Enhance indoor air environmental quality.
  5. Reduce the environmental impact of materials.
    - a. Recycled Content Products.
    - b. Environmental Management System protocols: ISO 14001 or equivalent.

#### 1.9 OWNER-FURNISHED CONTRACTOR INSTALLED PRODUCTS

- A. Owner will furnish products indicated to be installed by the Contractor. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products.
- B. Owner will furnish products indicated. The Work includes providing support systems to receive Owner's equipment and making plumbing, mechanical, and electrical connections.
1. Owner will arrange for and deliver Shop Drawings, Product Data, and Samples to Contractor.
  2. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule.
  3. After delivery, Owner will inspect delivered items for damage. Contractor shall be present for and assist in Owner's inspection.
  4. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
  5. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractor's Construction Schedule.
  6. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
  7. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
  8. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.
  9. Contractor shall install and otherwise incorporate Owner-furnished items into the Work.
  10. A schedule of owner furnished items is included on the drawings.

- C. Owner-Furnished Products:
  - 1. Items indicated on the drawings.

#### 1.10 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on drawings by the Contract limits and as indicated by requirements of this section.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Driveways, Walkways and Entrances: Keep driveways parking areas 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.
    - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

#### 1.11 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
- B. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- C. On-Site Work Hours: Work shall be carried out as described below:
  - 1. On-Site Work Hours: Work shall be generally performed inside the during normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, except otherwise indicated.
  - 2. Weekend Hours: Upon approval by the owner work times same as weekdays. There will be no additional costs to the Owner for necessary, scheduled sequence-required Contractor work performed after hours or weekend hours
  - 3. Early Morning Hours and Late Night Hours: Upon approval by the Owner. There will be no additional costs to the Owner for necessary, scheduled sequence-required Contractor work performed after hours.
  - 4. Work hours on weekends, early and late hours: A Contractor's superintendent shall be on site full time when any construction personnel are on site during this time.
  - 5. Hours for Utility Shutdowns: Notify and coordinate with Owner, utility shall not be shut down without approval of the Owner.
- D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify and obtain written permission from the Architect not less than 72 hours in advance of proposed utility interruptions.
  2. Do not proceed with utility interruptions without Owner's written permission.
- E. Controlled Substances: Use of tobacco, alcohol products and other controlled substances on Project site is not permitted.
- F. Listening Devices: Radios and any type of listening devices shall not be used on site except for official construction communication.
- G. Dress: Proper dress and shoes shall be worn on site at all times, no tank tops allowed.
- H. Employee Screening: Comply with requirements for drug and background screening of Contractor personnel working on Project site.
1. Maintain list of approved screened personnel with Owner's representative.

#### 1.12 SPECIFICATION AND DRAWING CONVENTIONS

- A. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- B. 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.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 10 00

## SECTION 01 23 00 – ALTERNATES

### 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 alternates.

#### 1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

#### 1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of alternates is included at the end of this section. Specification sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

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PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1 – Provide additional 2,755 gsf for new Workforce Development programs and area for a PT lab.
- B. Alternate No. 2 – Provide replacement of existing exterior doors and windows for the existing building L.

END OF SECTION 01 23 00



## SECTION 01 25 00 – SUBSTITUTION PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.

#### 1.3 DEFINITIONS

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

#### 1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use facsimile of form provided in Project Manual.
  - 2. Include complete information as required in the Substitution Form. Incomplete information will result in automatic rejection of the substitution request.
  - 3. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. Certificates and qualification data, where applicable or requested.
  - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - h. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - i. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - j. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
  - k. Cost information, including a proposal of change for a credit to the owner, if any, in the Contract Sum.
  - l. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
  - m. Submittals not requested will not be recognized or processed.
4. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor Construction Manager of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Substitution Request Form.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## 1.5 QUALITY ASSURANCE

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

## 1.6 PROCEDURES

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

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

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

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

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 25 00



# SUBSTITUTION REQUEST FORM

**Pre-Bid Substitution Request for convenience shall only be considered if submitted no later than 10 days prior to the Bid Date. Substitution Request for convenience received after that date shall not be considered. Substitution for cause will be accepted during the course of work.**



\_\_\_\_\_  
Contractor

\_\_\_\_\_  
Name

\_\_\_\_\_  
Specification Section

\_\_\_\_\_  
Date

\_\_\_\_\_  
Originally Specified Item, Manufacturer, and Model Number

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

\_\_\_\_\_  
Proposed Substitution Item, Manufacturer, and Model Number

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

1. Reason for requested change: \_\_\_\_\_
2. Does the product substitution effect any other trades: \_\_\_\_\_
3. The Contractor certifies the following:
  - a. The attached data consist of a description of the product including material, specifications, fabrication shop drawings, performance characteristics, and applicable test report.
  - b. The function, appearance, and quality of the proposed substitution will be equal or better than the originally specified item.
  - c. A written comparison of the proposed substitution requested item and the specified item will be provided.
  - d. The substitution will not require changes to the building design documents and will not adversely affect other trades, the project schedule, and specified warranties.
  - e. Servicing and maintenance of the substitution will not differ from the originally specified item.
  - f. No cost to the Owner will be associated with the substitution.
  - g. Contractor/CM shall assume responsibility for delay or claims arising from review and evaluation of requested product substitution.
  - h. Approval of proposed substitution shall have no effect on coordination and installation of work in accord with contract documents.
4. Substitution approval is an acceptance of only the manufacturer and product for general conformance with the design concept reflected in the Contract Documents. The A/E has made no attempt to verify specific performance data, or to check the details of the proposed substitution as to special features, capacities, physical dimensions or code and/or regulatory compliance, all of which remain the responsibility of the person/entity submitting the proposed substitution.
5. Contractor/CM Signature: \_\_\_\_\_

**Review:**

- Approved
- Approved as Noted
- Rejected
- Request Received Late and Rejected

Reviewer: \_\_\_\_\_

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

END OF SECTION 01 25 00.1



## SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

#### 1.3 ARCHITECTURAL SUPPLEMENTAL INSTRUCTIONS

- A. Architect will issue Architectural Supplemental Instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."
- B. In the event a change in Contract Sum or Contract Time is required by the Contractor, he shall so inform the Architect in writing within one (1) week of receipt of Supplemental Instruction or Clarification. A subsequent Proposal Request and Change Order will be issued prior to the Contractor proceeding with the work, unless a specific cost and/or time change has been agreed to and authorization to proceed is included in the Supplemental Instruction, or is subsequently issued.
- C. Architect will sign and date the Supplemental Instruction or Clarification as authorization for the Contractor to proceed with changes.
- D. Contractor will sign and date the Supplemental Instruction to indicate agreement with the terms therein and return to the Architect.

#### 1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within twenty (20) days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

3. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
4. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
5. Include costs of labor and supervision directly attributable to the change.
6. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time. Request for additional time must show that the critical path and project completion schedule are impacted by the change.
7. Proposal Requests are not valid until Architect and Owner approve in writing. Upon approval the Proposal Request will be incorporated into a Contingency Adjustment Authorization.
8. Quotation Form: Use AIA G709.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time. Request for additional time must show that the critical path and project completion schedule are impacted by the change.
6. Comply with requirements in specification section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Requests are not valid until Architect and Owner approve in writing. Upon approval the Proposal Request will be incorporated into a Contingency Adjustment Authorization.
8. Proposal Request Form: Use AIA G709.

#### 1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

#### 1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714 – "Construction Change Directive" instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.



1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

#### 1.7 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will prepare and issue a Change Order for signatures of Owner and Contractor on AIA Document G701 – "Change Order."
- B. Change Order will constitute authorization to proceed with additions and deletions as defined by Proposal Request.
- C. Change Order will provide an accounting of the adjustment in the Contract Sum and/or Contract Time.
- D. Content of Change Order will be based on either:
  1. Architect's Proposal Request and Contractor's responsive Proposal as mutually agreed between Owner and Contractor.
  2. Contractor's Proposal for a change as recommended by Architect.
  3. Owner authorized Construction Change Directive as mutually agreed between Owner and Contractor and recommended by Architect.
  4. Executed Architect's Supplemental Instructions.
- E. Owner will sign and date the Change Order as authorization for the Contractor to proceed with the changes.
- F. Contractor will sign and date the Change Order to indicate agreement with the terms therein

#### 1.8 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of work, and to record the adjusted Contract Sum. Submit along with Applications for Payment.
- B. Periodically revise the Construction Schedule to reflect each change in Contract Time:
  1. Revise schedules to show changes for other items of work affected by the changes.
  2. Submit revised Schedule to Architect and Owner; submit revised schedules to subcontractors of other work affected by the changes.

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PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXECUTION OF CONSTRUCTION CHANGE DIRECTIVES AND PROPOSAL REQUESTS

- A. Contractor shall, upon receipt of either document, proceed in a timely fashion to execute the documents and incorporate required items into the project when so indicated. Execute documents within two (2) weeks.
- B. Contractor shall inform all affected trades immediately upon receipt of above mentioned documents and receive written indication of either no change in Contract Price, or a fully itemized breakdown of costs to be incurred. Price breakdowns shall be documented as indicated.

END OF SECTION 01 26 00

## SECTION 01 29 00 – PAYMENT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
  - 1. Schedule of values
  - 2. Applications of payment

#### 1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

#### 1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
- B. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the schedule of values.
- C. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
  - 1. Application for Payment forms with continuation sheets.
  - 2. Submittal schedule.
  - 3. Items required to be indicated as separate activities in Contractor's construction schedule.
- D. Submit the schedule of values to Architect at earliest possible date, but no later than ten days after the Notice to Proceed.
- E. Format and Content
  - 1. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one-line item for each Specification Section.
    - a. Identification: Include the following Project identification on the schedule of values:
      - 1) Project name and location.

- 2) Name of Architect.
  - 3) Architect's project number.
  - 4) Contractor's name and address.
  - 5) Date of submittal.
  - b. Arrange schedule of values consistent with format of AIA Document G703 or Contractor's form as approved by the Architect.
  - c. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
    - 1) Related Specification Section or Division.
    - 2) Description of the Work.
    - 3) Change Orders (numbers) that affect value.
    - 4) Dollar value of the following, as a percentage of the Contract Sum to the exact penny.
      - i. Labor.
      - ii. Materials.
      - iii. Equipment.
  - d. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents.
    - 1) Provide multiple line items as a basis for acceptance of the Schedule of Values for principal subcontract amounts in excess of five percent of the Contract Sum.
    - 2) Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
  - e. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
    - 1) Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
- F. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## 1.5 APPLICATION FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the 25th day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
  1. Submit draft copy of Application for Payment five (5) days prior to due date for review by Architect, by direct e-mail to the Architect and designated Owner's representatives.

- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
  - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
  - 5. When Architect finds Application properly completed and correct, he will transmit Certificate for Payment to Owner. Incorrect or incomplete Certificates will not be reviewed until they have been corrected and resubmitted by the Contractor.
- F. When Architect finds Application properly completed and correct, he will transmit Certificate for Payment to Owner. Incorrect or incomplete Certificates will not be reviewed until they have been corrected and resubmitted by the Contractor.
- G. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
  - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
  - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  - 2. When an application shows completion of an item, submit conditional final or full waivers.
  - 3. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
  - 4. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- I. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.
  - 2. Schedule of values.
  - 3. Contractor's construction schedule (preliminary if not final).
  - 4. Products list (preliminary if not final).
  - 5. Submittal schedule (preliminary if not final).
  - 6. List of Contractor's staff assignments.
  - 7. List of Contractor's principal consultants.
  - 8. Copies of building permits.

9. Report of preconstruction conference.
  10. Certificates of insurance and insurance policies.
  11. Performance and payment bonds.
  12. Data needed to acquire Owner's insurance.
  13. Sustainable design action plans.
    - a. Recycle collection and processing plan
    - b. Materials Disposal Plan
    - c. Materials tracking system
  14. Schedule of unit prices.
- J. Sustainability
1. Sustainable design submittal for project materials cost data shall be submitted by the third payment requisition submittal.
- K. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
  2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  3. Updated final statement, accounting for final changes to the Contract Sum.
  4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  6. AIA Document G707, "Consent of Surety to Final Payment."
  7. Evidence that claims have been settled.
  8. Final meter readings for utilities and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  9. Final liquidated damages settlement statement.
  10. Four (4) signed and notarized original copies and noted as Final Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
  11. Final schedule of values.
  12. Power of attorney from Surety for release of final payment, signed and sealed and dated same as Consent of Surety.
  13. Certificate of Contract Completion:
  14. Page one completed by the Construction Manager, submit original plus three copies
  15. Page two completed by the Architect, submit original plus three copies
  16. Construction Manager's certification letter for the Guarantee of Construction for one year from substantial completion.
  17. Copy of the approval and verification of transmittal by the Construction Manager to the Architect of manuals, shop drawings, as-builts (one set of sepias and two sets prints), brochures, warranties and list of subcontractors with telephone numbers and addresses.

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18. Verification that the Owner's personnel have been trained in the operation of their new equipment (HVAC, controls, fire alarm, etc.) with list of attendees at each training section.
19. Fully executed warranties in the name of the Owner.
20. Architect's Certificate of Specification of Asbestos Containing Materials.
21. Construction Manager's Certificate of Asbestos Use.
22. Copy of Certificate of Occupancy.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 29 00





## SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 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.

#### 1.3 DEFINITIONS

- A. RFI: Request from Contractor seeking information required by or clarifications of the Contract Documents.

#### 1.4 DOCUMENT SUBMISSION

- A. Submittal of Applications for Payment, Change Orders, Construction Change Directives and Proposal Request shall be submitted by direct e-mail to the Architect and the designated owner's representatives. Other documents can be submitted by e-mail or drop box.

#### 1.5 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. 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 fifteen (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 temporary field office. Keep list current at all times.

#### 1.6 PROJECT USE SITE PLAN

- A. The Contractor shall prepare a proposed project use of the site plan.
- B. Contractor shall confine operations at the site to areas within the areas indicated and as approved on the use of the site plan, and as permitted by law, ordinances, and permits. Site shall not be unreasonably encumbered with materials, products, or construction equipment.
- C. The Contractor in reviewing his use of the site shall include access to proposed building for construction purposed, storage of materials and products, parking, where possible, for employees, temporary facilities including offices, storage, and workshop sheds or portable trailers, and unloading space.
- D. Where a temporary fence is to be provided, the Contractor shall show any additional area needed in the Contractor's use of the site beyond that which may be indicated on the Drawings. Where additional fencing is required, such fencing shall be included at no additional cost to the Owner.

#### 1.7 GENERAL COORDINATION PROCEDURES

- 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. 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.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  1. Preparation of Contractor's construction schedule.
  2. Preparation of the schedule of values.
  3. Installation and removal of temporary facilities and controls.
  4. Delivery and processing of submittals.
  5. Progress meetings.
  6. Preinstallation conferences.

7. Project closeout activities.
8. Startup and adjustment of systems.

D. 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.

## 1.8 COORDINATION DRAWINGS

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 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 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 specification 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 Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.
3. Architect will furnish Contractor one set of digital data files of drawings for use in preparing coordination digital data files.
  - a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to drawings.
  - b. Contractor shall execute a waiver agreement in the form acceptable to Owner and Architect.

#### 1.9 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 will return RFIs submitted to Architect 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.
  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 Contractor's form if acceptable and approved by the Architect.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect 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 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's actions on submittals.
    - g. Incomplete RFIs or inaccurately prepared RFIs.
  2. Architect's 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's 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 Section 012600 "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 Tracking Log:

1. Prepare, maintain, and submit a tracking log of RFIs organized by a tracking number. Submit log with not less than the following:
  - a. Project name.
  - b. Name and address of Contractor.
  - c. Name and address of Architect.
  - d. Provide sequential tracking numbers including RFIs that were returned without action or withdrawn.
  - e. RFI description.
  - f. Date the RFI was submitted.
  - g. Date Architect's response was received.
  - h. On receipt of Architect'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.
  - i. Provide identification of related Proposal Requests, Contractor Initiated Proposals and Construction Change Directives as appropriate.

1.10 TRACKING LOGS - COs, CCDs, PRs and ASIs

- A. Prepare, maintain, and submit individual tracking logs for Change Orders (COs), Construction Change Directives (CCDs), Proposal Requests (PRs) and Architects Supplemental Instructions (ASIs), organized by a tracking number. Submit log with not less than the following:
1. Project name.
  2. Name and address of Contractor.
  3. Name and address of Architect.
  4. Provide sequential tracking numbers.
  5. Item description.
  6. Date the item was submitted for review.
  7. Date Architect's response was received.
  8. Date the item was revised if applicable.
  9. The tracking number shall remain part of the log even if the item was deemed to be denied or un-needed.
  10. Provide documentation of the links and progressions of related CDs, CCDs, PRs and ASIs as appropriate.
  11. The PR log shall list all items which may become a CD at a later date but have not yet been approved.
  12. Update the logs and distribute the response to affected parties

1.11 PROJECT MEETINGS

- A. General: Contractor shall schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Contractor is responsible for conducting meeting and will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three (3) days of the meeting.

- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 10 days after Notice to proceed.
1. Conduct the conference to review responsibilities and personnel assignments.
  2. Attendees: Authorized representatives of Owner, Commissioning Authority, Contractor, Architect, 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. Critical work sequencing and long-lead items.
    - c. Designation of key personnel and their duties.
    - d. Lines of communications.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for Architectural Supplemental Instruction.
    - 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 and existing building.
    - n. Work restrictions.
    - o. Working hours.
    - p. Responsibility for temporary facilities and controls.
    - q. Procedures for moisture and mold control.
    - r. Procedures for disruptions and shutdowns.
    - s. Construction waste management and recycling.
    - t. Parking availability.
    - u. Office, work, and storage areas.
    - v. Equipment deliveries and priorities.
    - w. First aid.
    - x. Security.
    - y. Progress cleaning.
    - z. Sustainable design requirements
  4. Minutes: Contractor is responsible for conducting meeting and will record and distribute meeting minutes.
- C. Sustainable Design Coordination Conference: Schedule and conduct a sustainable design coordination conference before starting construction, at a time convenient to Owner, Contractor and Architect.
1. Attendees: Authorized representatives of Owner, Commissioning Authority, Contractor Architect, and their consultants; Contractor and its superintendent and sustainable design coordinator; 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.
  2. Agenda: Discuss items of significance that could affect meeting sustainable design requirements, including the following:
    - a. Sustainable design Project checklist.
    - b. General requirements for sustainable design-related procurement and documentation.

- c. Project closeout requirements and sustainable design certification procedures.
    - d. Role of sustainable design coordinator.
    - e. Construction waste management.
    - f. Construction operations and sustainable design requirements and restrictions.
  3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- D. Preinstallation Conferences: Conduct and schedule a preinstallation conference at Project site prior to thirty (30) days before each type of construction activity indicated.
  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, Contractor, and Owner's Commissioning Authority of scheduled meeting dates.
  2. List of Required Preinstallation Meetings: See specification section 01 33 00.1 Submittal Register.
  3. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents
      - 1) Drawing Revisions.
      - 2) Related RFIs.
      - 3) Related Change Orders.
      - 4) Options.
    - b. General Conditions
      - 1) Submittals.
      - 2) Manufacturer's written instructions.
      - 3) Testing and inspecting requirements.
      - 4) Coordination with other work.
      - 5) Weather limitations.
      - 6) Deliveries.
      - 7) Time schedules.
      - 8) Required performance results.
      - 9) Compatibility requirements.
      - 10) Regulations of authorities having jurisdiction.
    - c. Products
      - 1) Primary items indicated in specifications.
      - 2) Accessory items listing in specifications.
    - d. Execution
      - 1) Protection of adjacent work.
      - 2) Protection of construction and personnel.
      - 3) Possible conflicts.
      - 4) Temporary facilities and controls.
      - 5) Space and access limitations.
      - 6) Review of mockups
      - 7) Installation procedures.
      - 8) Acceptability of substrates.
      - 9) Installation of primary items indicated in specifications.
      - 10) Installation of accessory items listing in specifications.
  4. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  5. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.



6. 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.
- E. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 60 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, Commissioning Authority, Contractor, 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. Installation of Owner's furniture, fixtures, and equipment.
    - l. Responsibility for removing temporary facilities and controls.
    - m. Requirements for completing sustainable design documentation.
  4. Minutes: The Contractor conducting meeting and will record and distribute meeting minutes.
- F. Progress Meetings: Conduct progress meetings at intervals scheduled on a regular time as coordinated by the Architect and Owner.
1. Coordinate dates of meetings with preparation of payment requests.
  2. Attendees: In addition to representatives of Contractor and Architect, 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) Status of submittals.
  - 4) Status of sustainable design documentation.
  - 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.
  - 20) Tracking logs.
- c. Schedule Updating: Revise construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 31 00

## SECTION 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Preliminary Construction Schedule.
  - 2. Contractor's Construction Schedule.
  - 3. Submittals Schedule.
  - 4. Daily construction reports.
  - 5. Bi-Weekly Construction reports.
  - 6. Field condition reports.
  - 7. Special reports.

#### 1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
  - 2. Predecessor activity is an activity that must be completed before a given activity can be started.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time belongs to Owner.
  - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

- F. Fagnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- G. Major Area: A story of construction, a separate building, or a similar significant construction element.
- H. Milestone: A key or critical point in time for reference or measurement.
- I. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

#### 1.4 SUBMITTALS

- A. Qualification Data: For firms and persons specified in "Quality Assurance" Article and in-house scheduling personnel to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Submittals Schedule: Submit three (3) copies of schedule. Arrange the following information in a tabular format:
  - 1. Scheduled date for first submittal.
  - 2. Submittal number.
  - 3. Resubmittal number
  - 4. Specification Section number and title.
  - 5. Submittal category (action or informational).
  - 6. Name of subcontractor.
  - 7. Description of the Work covered.
  - 8. Scheduled date for Architect's final release or approval.
- C. Preliminary Construction Schedule: Submit three (3) printed copies; one a single sheet of reproducible media, and two prints.
- D. Preliminary Network Diagram: Submit three (3) printed copies; one a single sheet of reproducible media, and two prints; large enough to show entire network for entire construction period.
- E. Contractor's Construction Schedule: Submit three (3) printed copies of initial schedule, one a reproducible print and two blue- or black-line prints, large enough to show entire schedule for entire construction period.
- F. CPM Reports: Concurrent with CPM schedule, submit three (3) printed copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float.
  - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.

2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.

G. Daily Construction Reports: Submit two (2) copies at weekly intervals.

H. Field Condition Reports: Submit two (2) copies at time of discovery of differing conditions.

I. Special Reports: Submit two (2) copies at time of unusual event.

## 1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting.

## 1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

## PART 2 - PRODUCTS

### 2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those 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.

## 2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
  - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
  - 1. Activity Duration: Define activities so no activity is longer than twenty (20) days, unless specifically allowed by Architect.
  - 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
  - 4. Startup and Testing Time: Include not less than five (5) days for startup and testing.
  - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
  - 1. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  - 2. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 1 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  - 3. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Partial occupancy before Substantial Completion.
    - b. Use of premises restrictions.
    - c. Environmental control.
  - 4. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
    - a. Subcontract awards.
    - b. Submittals.
    - c. Purchases.
    - d. Mockups.
    - e. Fabrication.
    - f. Sample testing.
    - g. Deliveries.
    - h. Installation.
    - i. Tests and inspections.
    - j. Adjusting.
    - k. Curing.
    - l. Startup and placement into final use and operation.

5. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
  - a. Structural completion.
  - b. Permanent space enclosure.
  - c. Completion of mechanical installation.
  - d. Completion of electrical installation.
  - e. Substantial Completion.
  - f. Final Completion.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, interim milestones indicated below, Substantial Completion, and Final Completion.

1. Pre-construction Conference.

F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.

1. Refer to Division 1 Section "Payment Procedures" for cost reporting and payment procedures.

G. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

## 2.3 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven (7) days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first sixty (60) days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

## 2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. Preliminary Network Diagram: Submit diagram within ten (10) days of date established for Notice of Award. Outline significant construction activities for the first sixty (60) days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare Contractor's Construction Schedule using a CPM network analysis diagram.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than thirty (30) days after date established for the Notice of Award.
  2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
  3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
  4. Use "one workday" as the unit of time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Preparation and processing of submittals.
    - b. Purchase of materials.
    - c. Delivery.
    - d. Fabrication.
    - e. Installation.
    - f. Tests and inspections.
    - g. Startup and placement into final use and operation.
  2. Processing: Process data to produce output data or a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
  3. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
    - a. Sub-networks on separate sheets are permissible for activities clearly off the critical path.
- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
  2. Description of activity.
  3. Principal events of activity.
  4. Immediate preceding and succeeding activities.
  5. Early and late start dates.
  6. Early and late finish dates.
  7. Activity duration in workdays.
  8. Total float or slack time.
  9. Average size of workforce.
  10. Dollar value of activity (coordinated with the Schedule of Values).
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
  2. Changes in early and late start dates.
  3. Changes in early and late finish dates.
  4. Changes in activity durations in workdays.
  5. Changes in the critical path.
  6. Changes in total float or slack time.



7. Changes in the Contract Time.

2.5 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
  2. List of separate contractors at Project site.
  3. Approximate count of personnel at Project site.
  4. High and low temperatures and general weather conditions.
  5. Accidents.
  6. Meetings and significant decisions.
  7. Unusual events (refer to special reports).
  8. Stoppages, delays, shortages, and losses.
  9. Meter readings and similar recordings.
  10. Emergency procedures.
  11. Orders and requests of authorities having jurisdiction.
  12. Change Orders received and implemented.
  13. Local, State, and Federal Inspections
  14. Construction Change Directives received.
  15. Services connected and disconnected.
  16. Equipment or system tests and startups.
  17. Partial Completions and occupancies.
  18. Substantial Completions authorized.
- B. Material Location Reports: At bi-monthly intervals, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.6 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.
- C. Safety: Provide reports of safety meeting being conducted on a monthly basis.
- D. Incidents/ Injuries: Provide any safety violations, incidents or injuries that occur on the project's site immediately following such event.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
  - 1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
  - 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
  
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one (1) day before each regularly scheduled progress meeting.
  - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  - 3. As the Work progresses, indicate Actual Completion percentage for each activity.
  
- C. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
  - 1. Post copies in Project meeting rooms and temporary field offices.
  - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

## SECTION 01 32 33 – PHOTOGRAPHIC DOCUMENTATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  1. Preconstruction documentation.
  2. Periodic construction documentation.
  3. Final completion construction documentation.
  4. Aerial videos.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each documentation. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

#### 1.4 QUALITY ASSURANCE

- A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three (3) years.

#### 1.5 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

### PART 2 - PRODUCTS

#### 2.1 PHOTOGRAPHIC MEDIA

- A. Video Recordings: Submit video recording of existing conditions prior to commencement of construction.
  1. Digital Video Camera: Minimum sensor resolution of 8 megapixels.

2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of each image, accompanied by key plan file.
3. Submit video recordings in digital video disc format acceptable to Architect.
4. Identification: With each submittal, provide the following information:
  - a. Name of Project.
  - b. Name and contact information for photographer.
  - c. Name of Architect.
  - d. Name of Contractor.
  - e. Date video recording was recorded.

## 2.2 AERIAL MEDIA

- A. Aerial Video Recordings: Submit aerial video recording of the project with each payment requisition.
  1. Digital Video Camera: Minimum sensor resolution of 8 megapixels.
  2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of each image, accompanied by key plan file.
  3. Submit video recordings in digital video disc format acceptable to Architect.
  4. Identification: With each submittal, provide the following information:
    - a. Name of Project.
    - b. Name and contact information for photographer.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Date video recording was recorded.

## PART 3 - EXECUTION

### 3.1 CONSTRUCTION VIDEO RECORDINGS

- A. Confirm date and time at beginning and end of recording.
- B. Begin each video recording with name of Project, Contractor's name, videographer's name, and project location.
- C. Preconstruction Video Recording: Before starting construction, record video recording of Project site, surrounding properties and existing building conditions from different vantage points, as directed by Architect. Minimum recording time shall be 10 minutes.
  1. Flag construction limits before recording construction video recordings.
  2. Show existing conditions before starting the Work.
  3. Show existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing or excavation support and protection systems.

3.2 AERIAL VIDEO

- A. Periodic Construction Aerial Video Recordings: Record video recording monthly with the cutoff date associated with each application for payment. Select vantage points to show status of construction and progress since last video recordings were recorded. Minimum recording time shall be 10 minutes(s).

END OF SECTION 01 32 33



## SECTION 01 33 00 – SUBMITTAL PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 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. Partial submittals without prior approval or incomplete submittals will be returned without review.
  - 1. Prior approval from the Architect shall be obtained for partial submittals prepared for a specific product submittal.
- C. Submittals will be deemed complete if all items required in the submittal sections of the subject specification section have been assembled into a single submittal package.
- D. Submittals will not be accepted for review until the Schedule of Submittals, per article 1.4 has been submitted to the Architect.

#### 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'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. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. 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 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 all submittals during the first 60 days of construction and include all critical path related submittals that occur beyond 60 days. 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 the final schedule with all submittals including known and anticipated submittals 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 concurrently with each construction schedule update.
  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's final release or approval.
    - g. Scheduled date of fabrication.
    - h. Scheduled dates for purchasing.
    - i. Scheduled dates for installation.

#### 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
1. Architect will furnish requested digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
    - a. Architect 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 Revit 2018.
    - c. Construction Manager 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.
  2. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
    - a. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.



- 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 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'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 ten (10) days for Architectural initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect 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 ten (10) days for Architectural review of each resubmittal.
  4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect 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). File name shall follow contractor's standard system.
  3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
  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.
    - 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 number.
  - 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 by Specification Section.
  - q. Submittal and transmittal distribution record.
  - r. Other necessary identification.
  - s. Remarks.
- E. 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 on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- F. Options: Identify options requiring selection by the Architect.
- 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 and resubmittal number.
  - 3. Resubmit submittals until they are marked with approval notation from Architect'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'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 will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
  - 2. 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. 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 a PDF electronic file format.
- 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'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.
  2. PDF electronic file: Submit format to be 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
  3. Submit Shop Drawings in a PDF electronic file format.
- 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 with 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 two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one 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 two sets of Samples. Architect will retain one Sample set; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
      - 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. Contractor's Construction Schedule: Comply with requirements specified in specification section "Construction Progress Documentation."
- G. Application for Payment and Schedule of Values: Comply with requirements specified in specification section "Payment Procedures."
- H. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in specification section "Quality Requirements."

- I. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in specification section "Closeout Procedures."
- J. Maintenance Data: Comply with requirements specified in specification section "Operation and Maintenance Data."
- K. 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.
- L. 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.
- M. 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.
- N. 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.
- O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- Q. 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.
- R. 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.
- S. 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.
- T. 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.

- U. 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.
- V. 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.
- W. 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.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and three (3) 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.
- C. Project Closeout and Maintenance Material Submittals: See requirements in specification section "Closeout Procedures."

## 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.
- B. Project Closeout and Maintenance Material Submittals: See requirements in specification 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.

### 3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
1. No Exceptions.
  2. Exceptions.
  3. Resubmit.
  4. Partial Resubmittal.
  5. Other
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 01 33 00





Section 01 33 00.1 - Submittal Register

		Action Submittals							Information Submittals					Miscellaneous			Landscape/Irrigation/Civil					
		Product Data	Shop Drawings	Samples	Schedules	Coordination Drawings	Dedicated Design Calculations	Florida Product Approval or N.O.A.	Mix Design	Installer and/or MFG's Qualifications	Product Test Data & Certifications	Mfg. Installation Instructions	O&M Data	Sample Mfg. Warranty	Mock-Up	Pre-Installation Meeting	T&B Report	Irrigation Zoning Chart	Irrigation Controller Timing Schedule	Field Quality Control Reports	Soil Test Reports	Soil Testing Agency Qualifications
<b>Division 1 - General Requirements</b>																						
01 56 39	Temporary Tree and Plant Protection	X	X	X	X					X	X		X		X					X		
<b>Division 2 - Existing Conditions</b>																						
<b>Division 3 - Concrete</b>																						
03 10 00	Concrete Floor Removal and Replacement	X								X	X											
03 10 10	Cast-In-Place Concrete Patching	X								X	X											
03 30 00	Cast-In-Place Concrete	X	X					X		X	X											
03 35 00	Concrete Floor Finishing	X																				
03 45 00	Precast Architectural Concrete	X	X	X				X	X	X				X								
03 54 16	Hydraulic Cement Underlayment		X				X	X	X	X	X											
<b>Division 4 - Masonry</b>																						
04 05 00	Masonry Grout																					
04 10 22	Masonry Infill	X	X	X					X	X				X	X							
04 10 24	Masonry Repair																					
04 20 00	Unit Masonry	X	X	X					X	X				X	X							
04 20 18	Unit Masonry Assemblies																					
04 21 13	Brick Masonry Veneer	X	X	X					X	X				X	X							
04 23 00	Reinforced Unit Masonry																					
04 72 00	Cast Stone Masonry	X	X	X					X	X				X								
<b>Division 5 - Metals</b>																						
05 12 00	Structural Steel Framing	X	X						X	X												
05 21 00	Steel Joist Framing	X	X			X			X	X												
05 31 00	Steel Decking	X	X						X	X												
05 50 00	Metal Fabrications	X	X	X		X			X	X												
05 52 13	Pipe and Tube Railings	X	X	X		X			X	X												
<b>Division 6 - Wood, Plastics and Composites</b>																						
06 10 00	Rough Carpentry	X								X												
06 16 00	Sheathing	X								X												
06 20 00	Finish Carpentry	X	X	X						X												
06 41 16	Plastic-Laminate Clad Architectural Cabinets	X	X	X					X	X				X								
06 45 60	Manufactured Foam Trim	X	X	X																		
<b>Division 7 - Thermal and Moisture Protection</b>																						
07 14 16	Cold Fluid-Applied Waterproofing	X							X				X									
07 19 00	Water Repellents	X		X					X	X				X								
07 21 00	Thermal Insulation	X		X						X												
07 21 19	Foamed-In-Place Insulation	X								X												
07 26 00	Vapor Retarders	X							X	X	X											
07 31 13	Asphalt Shingles	X		X					X	X				X								
07 42 15	Formed Metal Ceiling and Wall Panels	X	X			X			X	X				X	X							
07 52 00	Modified Bitumen Membrane Roofing	X	X	X			X	X	X	X				X	X							
07 62 00	Sheet Metal Flashing and Trim	X	X	X		X				X				X								
07 84 13	Penetration Firestopping	X	X		X				X	X					X							
07 92 00	Joint Sealants	X		X	X				X	X				X								
07 95 00	Expansion Control	X	X	X						X												
<b>Division 8 - Openings</b>																						
08 11 13	Hollow Metal Doors and Frames	X	X	X	X		X	X	X	X				X								
08 14 16	Flush Wood Doors	X	X	X																		
08 31 13	Access Doors and Frames	X	X	X						X												
08 33 26	Overhead Coiling Grilles	X	X	X	X		X															
08 41 13	Aluminum-Framed Entrances and Storefronts	X	X	X			X	X	X					X		X						
08 71 00	Door Hardware	X																				
08 71 13	Automatic Door Operators	X	X				X		X	X					X							
08 80 00	Glazing	X	X	X	X		X	X	X	X				X	X							
08 80 20	Spandrel Insulated Panels	X	X							X				X								
08 91 19	Fixed Louvers	X	X	X			X			X												
<b>Division 9 - Finishes</b>																						
09 22 16	Non-Structural Metal Framing	X				X				X	X				X							
09 24 00	Cement Plastering	X	X	X										X	X							
09 24 10	Cement Plastering Repairing	X	X	X																		
09 25 00	Gypsum Board	X	X												X							
09 30 00	Tiling	X		X						X				X								
09 51 23	Acoustical Tile Ceilings	X		X		X				X												
09 51 25	Acoustical Ceiling Clouds	X		X																		

Section 01 33 00.1 - Submittal Register

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09 65 13	Resilient Base and Accessories	X		X	X																	
09 65 16	Resilient Sheet Flooring	X	X	X	X				X	X					X							
09 65 19	Resilient Tile Flooring	X		X						X			X									
09 68 13	Tile Carpeting	X	X	X					X													
09 75 23	Solid Surface Window Sills	X	X	X						X			X									
09 84 33	Sound-Absorbing Wall Units	X	X	X		X				X			X									
09 91 13	Exterior Painting	X		X					X					X								
09 91 23	Interior Painting	X		X					X					X								
<b>Division 10 - Specialties</b>																						
10 11 00	Visual Display Units	X	X	X					X	X			X									
10 14 16	Plaques		X						X						X							
10 14 23	Panel Signage	X	X	X	X				X													
10 21 13	HDPE Toilet Compartments	X	X	X						X												
10 26 00	Wall and Door Protection	X	X	X									X									
10 28 00	Toilet, Bath, and Laundry Accessories	X	X	X	X				X				X									
10 43 16	First Aid Cabinet	X	X	X	X				X				X									
10 44 00	Fire Protection Specialties	X	X	X	X				X				X									
10 51 21	Plastic Laminate Lockers																					
10 56 13	Metal Storage Shelving	X	X	X					X				X									
10 73 26	Walkway Coverings	X	X	X			X		X													
<b>Division 11 - Equipment</b>																						
11 31 00	Residential Appliances	X	X							X			X									
11 51 19	Book Theft Protection Equipment		X						X				X		X							
11 52 13	Projection Screens	X	X	X					X													
<b>Division 12 - Furnishings</b>																						
12 24 13	Roller Window Shades	X	X	X	X					X												
12 36 63	Quartz Countertops	X	X	X					X					X								
<b>Division 13 - Special Construction</b>																						
<b>Division 14 - Conveying Systems</b>																						
<b>Division 15</b>																						
<b>Division 21 - Fire Suppression System</b>																						
21 05 17	Sleeves and Sleeve Seals for Fire Suppression Piping	X																				
21 05 18	Escutcheons for Fire-Suppression Piping	X																				
21 05 23	General-Duty Valves for Water-Based Fire-Suppression Piping	X																				
21 05 53	Identification for Fire-Suppression Piping and Equipment	X			X																	
21 13 13	Wet-Pipe Sprinkler Systems	X	X			X				X		X										
<b>Division 22 - Plumbing</b>																						
22 05 23	Valves, Cocks and Specialties for Plumbing Systems	X																				
22 05 53	Identification for Plumbing Piping and Equipment	X																				
22 07 00	Insulation for Plumbing Systems	X																				
22 11 16	Plumbing	X																				
22 11 19	Domestic Cold and Hot Water Supply Piping and Hot Water Circulating Piping	X																				
22 13 16	Sanitary Sewer, Storm Water and Sanitary Vent Piping	X																				
22 13 17	Cleanouts and Cleanout Access Covers	X																				
22 13 19	Floor Drains	X																				
22 13 21	Drainage and Vent Systems	X																				
22 14 26	Roof Drains	X																				
22 34 05	Domestic Water Heaters: Commercial	X																				
22 40 00	Plumbing Fixtures	X																				
22 40 05	Plumbing Fixtures and Trim	X																				
<b>Division 23 - Heating, Ventilation, and Air-Conditioning (HVAC)</b>																						
23 01 00	General Mechanical Provisions	X	X																			
23 05 00	Basic Mechanical Materials and Methods																					
23 05 10	HVAC Demolition and Alterations																					
23 05 13	Electric Motors, Premium Efficiency Type	X																				
23 05 15	Instructions and Maintenance Manuals																					
23 05 16	Housekeeping Pads, Concrete																					
23 05 18	Piping: Condensate Drain																					
23 05 19	Gauges	X			X																	
23 05 20	Piping Systems: Flushing and Cleaning	X																				

Section 01 33 00.1 - Submittal Register

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23 05 21	Thermometers	X			X																	
23 05 23	Valves, Cocks and Specialties: HVAC																					
23 05 29	Hangers and Supports	X	X		X						X											
23 05 48	Vibration Isolation Equipment	X																				
23 05 53	Identification of Piping Systems and Equipment	X			X																	
23 05 93	Performance Verification, Preliminary																					
23 05 94	Performance Verification, Final																					
23 07 00	Insulation, HVAC	X	X			X				X												
23 08 00	Commissioning of HVAC																					
23 09 23	Direct Digital Control System	X	X	X	X																	
23 09 25	Variable Frequency Drives	X					X															
23 21 13	Piping Systems: HVAC, Water		X																			
23 30 05	Coordination Drawings	X	X			X																
23 31 00	Ductwork	X	X																			
23 33 00	Duct System Accessories	X	X																			
23 34 25	Fans: In-Line Centrifugal, Light Duty	X	X							X												
23 34 29	Fans: Centrifugal, Ceiling Mounted	X	X																			
23 36 16	Terminal Units: VAV, Single Inlet, Electric Coil	X	X						X			X										
23 37 13	Air Distribution Devices	X																				
23 37 25	Louvers		X																			
23 43 24	Air Purification System	X										X										
23 73 13	Air Handling Units, Central Station, Modular	X	X																			
<b>Division 26 - Electrical</b>																						
26 01 00	Basic Electrical Requirements	X	X									X										
26 05 00	Common Work Results for Electrical	X																				
26 05 19	Low-Voltage Electrical Power Conductors and Cables	X																				
26 05 26	Grounding and Bonding for Electrical Systems	X																				
26 05 29	Hangers and Supports for Electrical Systems	X	X																			
26 05 33	Raceway and Boxes for Electrical Systems	X	X																			
26 05 53	Identification for Electrical Systems																					
26 05 73.13	Short-Circuit Studies	X							X	X												
26 05 73.16	Coordination Studies	X							X	X		X										
26 05 73.19	ARC-Flash Hazard Analysis	X							X	X												
26 09 23	Lighting Control Devices	X	X									X										
26 22 00	Low-Voltage Transformers	X	X									X										
26 24 16	Panelboards	X	X		X							X										
26 27 26	Wiring Devices	X	X	X								X										
26 28 13	Fuses	X										X										
26 28 16	Enclosed Switches and Circuit Breakers	X							X			X										
26 41 13	Lightning Protection for Structures	X	X			X			X	X												
26 43 13	Surge Protection Devices	X										X	X									
26 51 19	LED Interior Lighting	X	X			X				X												
26 56 19	LED Exterior Lighting	X	X			X	X		X	X												
<b>Division 27 - Communications</b>																						
27 00 00	Communications																					
27 05 00	Common Work Results for Communications Systems	X				X																
27 05 26	Grounding and Bonding for Communications Systems	X																				
27 05 28	Pathways for Communications Systems																					
27 05 37	Firestopping for Communication Systems	X																				
27 05 53	Identification for Communications Systems																					
27 08 00	Commissioning of Communications Systems																					
27 11 00	Communications Equipment Room Fittings	X	X			X			X													
27 11 16	Communications Cabinets, Racks and Enclosures	X																				
27 11 19	Communications Termination Blocks and Patch Panels	X																				
27 11 23	Communications Cable Management and Ladder Rack	X																				
27 11 26	Communications Rack Mounted Power Distribution	X																				
27 13 23	Communications Fiber Backbone Cabling	X	X																			
27 15 13	Communications Copper Horizontal Cabling	X																				
27 15 33	Communications Coaxial Horizontal Cabling	X	X									X										
27 15 43	Communications Faceplates and Connectors	X																				
27 16 19	Communications Patch Cords and Workstation Cords	X																				

Section 01 33 00.1 - Submittal Register

		Action Submittals							Information Submittals					Miscellaneous			Landscape/Irrigation/Civil					
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<b>Division 28 - Electronic Safety and Security</b>																						
28 00 00	Electronic Safety and Security Systems	X																				
28 05 00	Common Work Results for Electronic Safety and Security	X																				
28 05 13	Conductors and Cables for Electronic Safety and Security	X										X										
28 08 00	Commissioning of Electronic Safety and Security Systems																					
28 13 00	Access Control System	X	X						X	X												
28 31 11	Digital, Addressable Fire-Alarm System	X					X		X		X	X										
<b>Division 31 - Earthwork</b>																						
31 10 00	Site Clearing				X										X							
31 20 00	Earth Moving	X								X									X	X	X	
31 25 00	Erosion and Sedimentation Controls									X												
31 31 00	Soil Treatment	X								X												
31 50 00	Excavation Support and Protection		X						X													
<b>Division 32 - Exterior Improvements</b>																						
32 13 13	Concrete Paving	X		X				X	X	X				X	X				X			
32 31 13	Chain Link Fences and Gates	X	X	X			X		X	X		X	X									
32 84 00	Planting Irrigation	X			X				X			X	X		X		X	X	X			
32 92 00	Turf and Grasses	X							X	X		X			X					X		
32 93 00	Plants	X			X				X	X		X	X		X					X		
32 96 00	Transplanting	X	X		X				X	X		X			X				X			
<b>Division 33 - Utilities</b>																						
33 05 00	Common Work Results for Utilities	X	X	X		X																
33 10 00	Water Utilities	X				X				X		X	X							X		
33 30 00	Sanitary Sewerage Utilities	X	X							X			X							X		
33 40 00	Storm Drainage Utilities	X	X			X		X		X			X							X		



**AIA**<sup>®</sup>

# Document C106™ – 2013

## Digital Data Licensing Agreement

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

**BETWEEN** the Party transmitting Digital Data ("Transmitting Party"):  
*(Name, address and contact information, including electronic addresses)*

| HARVARD JOLLY, INC.

and the Party receiving the Digital Data ("Receiving Party"):  
*(Name, address and contact information, including electronic addresses)*

for the following Project:  
*(Name and location or address)*

| HJ Templates

The Transmitting Party and Receiving Party agree as follows.

### TABLE OF ARTICLES

- 1      GENERAL PROVISIONS
- 2      TRANSMISSION OF DIGITAL DATA
- 3      LICENSE CONDITIONS
- 4      LICENSING FEE OR OTHER COMPENSATION
- 5      DIGITAL DATA

### ARTICLE 1    GENERAL PROVISIONS

§ 1.1 The purpose of this Agreement is to grant a license from the Transmitting Party to the Receiving Party for the Receiving Party's use of Digital Data on the Project, and to set forth the license terms.

§ 1.2 This Agreement is the entire and integrated agreement between the parties. Except as specifically set forth herein, this Agreement does not create any other contractual relationship between the parties.

### 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.

Init.



§ 1.3 For purposes of this Agreement, the term Digital Data is defined to include only those items identified in Article 5 below.

§ 1.3.1 Confidential Digital Data is defined as Digital Data containing confidential or business proprietary information that the Transmitting Party designates and clearly marks as "confidential."

## ARTICLE 2 TRANSMISSION OF DIGITAL DATA

§ 2.1 The Transmitting Party grants to the Receiving Party a nonexclusive limited license to use the Digital Data identified in Article 5 solely and exclusively to perform services for, or construction of, the Project in accordance with the terms and conditions set forth in this Agreement.

§ 2.2 The transmission of Digital Data constitutes a warranty by the Transmitting Party to the Receiving Party that the Transmitting Party is the copyright owner of the Digital Data, or otherwise has permission to transmit the Digital Data to the Receiving Party for its use on the Project in accordance with the terms and conditions of this Agreement.

§ 2.3 The Transmitting Party retains its rights in the Digital Data. By transmitting the Digital Data, the Transmitting Party does not grant to the Receiving Party an assignment of those rights; nor does the Transmitting Party convey to the Receiving Party any right in the software used to generate the Digital Data.

*(Paragraph deleted)*

§ 2.4 To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party's licensed use, modification to, or unlicensed use of, the Digital Data.

§ 2.5 The Receiving Party agrees to keep Confidential Information strictly confidential and not to disclose it to any other person except to (1) its employees, (2) those who need to know the content of the Confidential Information in order to perform services or construction solely and exclusively for the Project, or (3) its consultants and contractors whose contracts include similar restrictions on the use of Confidential Information.

## ARTICLE 3 LICENSE CONDITIONS

The parties agree to the following conditions on the limited license granted in Section 2.1:

*(State below rights or restrictions applicable to the Receiving Party's use of the Digital Data, requirements for data format, transmission method or other conditions on data to be transmitted.)*

The Receiving Party (and its subcontractors) understands and agrees the Digital Data for this Project is periodically undergoing changes and revisions for various reasons throughout the duration of the Project, and is being provided merely for the Receiving Party's convenience. Therefore the Digital Data transmitted represents a "snapshot" of the Project at an arbitrary point in time that does not necessarily correspond with what has already been formally issued by the Transmitting Party in hard copy format. Furthermore, the Receiving Party recognizes and agrees that it cannot solely rely on the Digital Data to be the most up-to-date or the official copy and must refer to formally issued documentation when utilizing the Digital Data to better ensure accurate use.

The Receiving Party (and its subcontractors) understands and agrees the Transmitting Party (and its consultants) will not accept shop drawings that are simply reproductions of the Digital Data, as it is the responsibility of the Receiving Party (and its subcontractors) to generate their own shop drawings to ensure their understanding of their scope of work to the level of detail required of their trade.

The Receiving Party (and its subcontractors) understands and agrees to reproduce and distribute the digital data for project specific use only. The Receiving Party (and its subcontractors) hereby agrees to hold the Transmitting Party (and its consultants) harmless in its use of the Digital Data. Construction Manager is responsible for communicating these terms to all contractors and subcontractors receiving Digital Data for the entire project scope and time.

## ARTICLE 4 LICENSING FEE OR OTHER COMPENSATION

The Receiving Party agrees to pay the Transmitting Party the following fee or other compensation for the Receiving Party's use of the Digital Data:

Init.

*(State the fee, in dollars, or other method by which the Receiving Party will compensate the Transmitting Party for the Receiving Party's use of the Digital Data.)*

\$0.00 for the initial transmission of PDF, CAD or REVIT files; \$500.00 for each subsequently requested transmission of PDF, CAD or REVIT files (payable in advance).

This Agreement is entered into as of the day and year first written above and will terminate upon Substantial Completion of the Project, as that term is defined in AIA Document A201™–2007, General Conditions of the Contract for Construction, unless otherwise agreed by the parties and set forth below.  
*(Indicate when this Agreement will terminate, if other than the date of Substantial Completion.)*

\_\_\_\_\_  
TRANSMITTING PARTY *(Signature)*

\_\_\_\_\_  
RECEIVING PARTY *(Signature)*

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

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

*(Table deleted)(Paragraphs deleted)*





## SECTION 01 35 16 – ALTERATION PROJECT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes special procedures for alteration work.

#### 1.3 DEFINITIONS

- A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. Consolidate: To strengthen loose or deteriorated materials in place.
- C. Design Reference Sample: A sample that represents the Architect's pre-bid selection of work to be matched; it may be existing work or work specially produced for the Project.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
- F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.
- J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- K. Retain: To keep existing items that are not to be removed or dismantled.

- L. Strip: To remove existing finish down to base material unless otherwise indicated.

#### 1.4 COORDINATION

- A. Alteration Work Sub-schedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.
  - 1. Schedule construction operations in sequence required to obtain best Work results.
  - 2. Coordinate sequence of alteration work activities to accommodate the following:
    - a. Other known work in progress.
    - b. Tests and inspections.
  - 3. Detail sequence of alteration work, with start and end dates.
  - 4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
  - 5. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.
- B. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project building(s) and site. Some work is near circulation patterns and adjacent to restricted areas. Circulation patterns cannot be closed off entirely and in places can be only temporarily redirected around small areas of work. Access to restricted areas may not be obstructed. Plan and execute the Work accordingly.

#### 1.5 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.
  - 1. Attendees: In addition to representatives of Owner, Contractor and Architect, testing service representative shall be represented at the meeting.
  - 2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
    - a. Alteration Work Sub-schedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
    - b. Fire-prevention plan.
    - c. Governing regulations.
    - d. Areas where existing construction is to remain and the required protection.
    - e. Hauling routes.
    - f. Sequence of alteration work operations.
    - g. Storage, protection, and accounting for salvaged and specially fabricated items.
    - h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
    - i. Qualifications of personnel assigned to alteration work and assigned duties.
    - j. Requirements for extent and quality of work, tolerances, and required clearances.
    - k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.

3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.

B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at bi-weekly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner, Contractor and Architect, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of alteration work activities shall be represented at these meetings. All participants at conference shall be familiar with Project and authorized to conclude matters relating to alteration work.
2. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.
  - a. Alteration Work Sub-schedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
  - b. Schedule Updating: Revise Contractor's Alteration Work Sub-schedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
  - c. Review present and future needs of each entity present, including review items listed in the "Preliminary Conference for Alteration Work" Paragraph in this article and the following:
    - 1) Interface requirements of alteration work with other Project Work.
    - 2) Status of submittals for alteration work.
    - 3) Access to alteration work locations.
    - 4) Effectiveness of fire-prevention plan.
    - 5) Quality and work standards of alteration work.
    - 6) Change Orders for alteration work.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

## 1.6 INFORMATIONAL SUBMITTALS

A. Alteration Work Sub-schedule:

1. Submit alteration work sub-schedule within thirty (30) days of date established for commencement of alteration work.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.

C. Alteration Work Program: Submit thirty (30) days before work begins.

D. Fire-Prevention Plan: Submit thirty (30) days before work begins.

## 1.7 QUALITY ASSURANCE

- A. Specialist Qualifications: An experienced firm regularly engaged in specialty work similar in nature, materials, design, and extent to alteration work as specified in each Section and that has completed a minimum of five (5) recent projects with a record of successful in-service performance that demonstrates the firm's qualifications to perform this work.
  - 1. Field Supervisor Qualifications: Full-time supervisors experienced in specialty work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on-site when specialty work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond the control of the specialist firm.
    - a. Construct new mockups of required work whenever a supervisor is replaced.
- B. Title X Requirement: Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" according to 40 CFR 745, Subpart E, and use only workers that are trained in lead-safe work practices.
- C. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.
  - 1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
  - 2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
- D. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.
- E. Safety and Health Standard: Comply with ANSI/ASSE A10.6.

## 1.8 STORAGE AND HANDLING OF SALVAGED MATERIALS

- A. Salvaged Materials:
  - 1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
  - 2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to Owner's storage area designated by Owner.
  - 5. Protect items from damage during transport and storage.
- B. Salvaged Materials for Reinstallation:
  - 1. Repair and clean items for reuse as indicated.

2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.
- C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.
- D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
  2. Secure stored materials to protect from theft.
  3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F (3 deg C) or more above the dew point.
- E. Storage Space:
1. Owner will arrange for limited on-site location(s) for free storage of salvaged material. This storage space does not include security for stored material.
  2. Arrange for off-site locations for storage and protection of salvaged material that cannot be stored and protected on-site.

## 1.9 FIELD CONDITIONS

- A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of preconstruction photographs and preconstruction videotapes.
1. Comply with requirements specified in Specification Section "Photographic Documentation."
- B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.
- C. Owner's Removals: Before beginning alteration work, verify in correspondence with Owner that the following items have been removed:
1. See drawings.
- D. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
  - 1. Use only proven protection methods, appropriate to each area and surface being protected.
  - 2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
  - 3. Erect temporary barriers to form and maintain fire-egress routes.
  - 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
  - 5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
  - 6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
  - 7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
  - 8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.
  
- B. Temporary Protection of Materials to Remain:
  - 1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
  - 2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.
  
- C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
  
- D. Utility and Communications Services:
  - 1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
  - 2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
  - 3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.
  
- E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

F. Existing Roofing: Prior to the start of work in an area, install roofing protection.

### 3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
  - a. If combustible material cannot be removed, provide fire blankets to cover such materials.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

1. Obtain Owner's approval for operations involving use of welding or other high-heat equipment. Use of open-flame equipment is not permitted. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
  - a. Train each fire watch in the proper operation of fire-control equipment and alarms.
  - b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
  - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
  - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
  - e. Maintain fire-watch personnel at each area of Project site until two hours after conclusion of daily work.

- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.
- D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
  - 1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

### 3.3 PROTECTION DURING APPLICATION OF CHEMICALS

- A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
- B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
- C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
- D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.
- E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

### 3.4 GENERAL ALTERATION WORK

- A. Have specialty work performed only by qualified specialists.
- B. Ensure that supervisory personnel are present when work begins and during its progress.
- C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs or video recordings. Comply with requirements in specification section "Photographic Documentation."
- D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.
- E. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

- 1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 01 35 16



## SECTION 01 40 00 – QUALITY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 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, Owner, Commissioning Authority, Contractor or authorities having jurisdiction are not limited by provisions of this section.
  - 4. Specific test and inspection requirements are not specified in this section.

#### 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.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
  - D. 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.
  - E. 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.
  - F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
  - G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
  - H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
  - I. 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).
  - J. 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.
  - K. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
    1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on the project site, consisting of multiple products, assemblies and subassemblies.
- 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 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 for a decision before proceeding.

#### 1.5 ACTION SUBMITTALS

- A. Shop Drawings: For 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. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
  - 1. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
- D. 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.

#### 1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within ten (10) days of Notice to Proceed, and not less than five (5) days prior to preconstruction conference. Submit in format acceptable to Architect. 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 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 QUALITY ASSURANCE

- A. Provide where required by Specifications.
- B. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- C. 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.
- D. 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.
- E. 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.
- F. 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.
- G. 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.
- H. Testing Agency Qualifications: 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.
- I. 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.
- J. 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.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
  2. Notify Architect seven (7) working days in advance of dates and times when mockups will be constructed.
  3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
  4. Demonstrate the proposed range of aesthetic effects and workmanship.
  5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
    - a. Allow seven (7) days for initial review and each re-review of each mockup.
  6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  7. Demolish and remove mockups when directed unless otherwise indicated.
- L. Integrated Exterior Mockups: Construct integrated exterior mockup in accordance with approved shop drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION

### 3.1 REPAIR AND PROTECTION

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

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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 specification 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 01 40 00

## SECTION 01 41 00 – REGULATORY REQUIREMENTS

### PART 1- GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 CODE REQUIREMENTS

- A. Perform all work on this Project in strict accordance with, but not limited to, applicable requirements and portions of the latest adopted editions of the currently adopted codes, revisions, amendments, supplements, and their references.

1. Florida Building Code:
  - a. Florida Building Code – Sixth Edition (2017)
  - b. Florida Building Code – Fuel Gas – Sixth Edition (2017)
  - c. Florida Building Code – Mechanical – Sixth Edition (2017)
  - d. Florida Building Code – Plumbing – Sixth Edition (2017)
  - e. National Electrical Code – FBC Chapter 27
  - f. FBC Referenced Codes and Standards – Chapter 35
2. Florida Fire Prevention Code, Ch. 69A-60, Florida Administrative Code – Sixth Edition (2017), which includes:
  - a. NFPA 1
  - b. Referenced Mandatory Codes and Standards listed in 69A-60.005, FAC
  - c. Referenced Mandatory Codes and Standards listed in NFPA 101
3. U.S. Access Board, Americans with Disabilities Act Architectural Guidelines, July 23, 2004, accessibility requirements for children
4. American Society of Civil Engineers – Minimum Design Loads for Buildings and Other Structures - ASCE 7
5. Florida Department of Education, State Requirements for Education Facilities (SREF)
6. State Fire Marshal's rule 69A-58 FAC
7. NFPA 70, 2014 Edition
8. NFPA 72, 2013 Edition

#### 1.3 CODE STANDARDS

- A. All work shall conform to applicable portions of the adopted, or the latest edition of the standards listed, which shall include, but is not limited to, the following:
1. Aluminum Association (AA)
  2. American Concrete Institute (ACI)
  3. American Institute of Steel Construction (AISC)
  4. American National Standards Institute (ANSI)
  5. American Society for Testing and Materials (ASTM)
  6. American Society of Mechanical Engineers (ASME)
  7. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)

8. American Welding Society (AWS)
9. Architectural Woodworking Institute (AWI)
10. Architectural Aluminum Manufacturer's Association (AAMA)
11. Commercial Standards (CS)
12. Federal Specifications and Standards (FSS)
13. National Occupations Safety and Health Administration (OSHA)
14. National Institute for Standards and Technology (NIST)
15. Architectural Sheet Metal Manual (SMACNA)
16. Underwriter's Laboratories (UL)
17. U.S. of America Standards Institute (ASI)
18. U.S. Department of Commerce Product Standards (USDCPS)

#### 1.4 CODE DISCREPANCIES

- A. In case of discrepancy between the codes, standards, and specifications listed, the most strict or most stringent requirement shall govern.

#### 1.5 COMPLIANCE WITH CODES

- A. A permit issued will be construed as permission to proceed with construction, and not as authority to violate, cancel, alter, or set aside any of the provisions of any Codes.
- B. Nor shall issuance of a permit prevent the Owner from thereafter requiring a correction of errors in plans, construction, or violations of any Codes.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 41 00



## SECTION 01 42 00 – REFERENCES

### 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 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

#### 1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

#### 1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
  - 1. AABC - Associated Air Balance Council; [www.aabc.com](http://www.aabc.com)
  - 2. AAMA - American Architectural Manufacturers Association; [www.aamanet.org](http://www.aamanet.org).
  - 3. AASHTO - American Association of State Highway and Transportation Officials; [www.transportation.org](http://www.transportation.org).
  - 4. ACI - American Concrete Institute; (Formerly: ACI International); [www.abma.com](http://www.abma.com).
  - 5. ACPA - American Concrete Pipe Association; [www.concrete-pipe.org](http://www.concrete-pipe.org).
  - 6. AF&PA - American Forest & Paper Association; [www.afandpa.org](http://www.afandpa.org).
  - 7. AGA - American Gas Association; [www.aga.org](http://www.aga.org).
  - 8. AHAM - Association of Home Appliance Manufacturers; [www.aham.org](http://www.aham.org).
  - 9. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); [www.ahrinet.org](http://www.ahrinet.org).
  - 10. AI - Asphalt Institute; [www.asphaltinstitute.org](http://www.asphaltinstitute.org).
  - 11. AIA - American Institute of Architects (The); [www.aia.org](http://www.aia.org).
  - 12. AISC - American Institute of Steel Construction; [www.aisc.org](http://www.aisc.org).
  - 13. AISI - American Iron and Steel Institute; [www.steel.org](http://www.steel.org).
  - 14. AMCA - Air Movement and Control Association International, Inc.; [www.amca.org](http://www.amca.org).
  - 15. ANSI - American National Standards Institute; [www.ansi.org](http://www.ansi.org).
  - 16. APA - APA - The Engineered Wood Association; [www.apawood.org](http://www.apawood.org).
  - 17. APA - Architectural Precast Association; [www.archprecast.org](http://www.archprecast.org).
  - 18. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
  - 19. ARI - American Refrigeration Institute; (See AHRI).
  - 20. ARMA - Asphalt Roofing Manufacturers Association; [www.asphaltroofing.org](http://www.asphaltroofing.org).
  - 21. ASCE - American Society of Civil Engineers; [www.asce.org](http://www.asce.org).
  - 22. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
  - 23. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; [www.ashrae.org](http://www.ashrae.org).
  - 24. ASME - ASME International; (American Society of Mechanical Engineers); [www.asme.org](http://www.asme.org).
  - 25. ASSE - American Society of Safety Engineers (The); [www.asse.org](http://www.asse.org).
  - 26. ASTM - ASTM International; [www.astm.org](http://www.astm.org).
  - 27. ATIS - Alliance for Telecommunications Industry Solutions; [www.atis.org](http://www.atis.org).

28. AWI - Architectural Woodwork Institute; [www.awinet.org](http://www.awinet.org).
29. AWPA - American Wood Protection Association; [www.awpa.com](http://www.awpa.com).
30. AWS - American Welding Society; [www.aws.org](http://www.aws.org).
31. BHMA - Builders Hardware Manufacturers Association; [www.buildershardware.com](http://www.buildershardware.com).
32. BIA - Brick Industry Association (The); [www.gobrick.com](http://www.gobrick.com).
33. CEA - Consumer Electronics Association; [www.ce.org](http://www.ce.org).
34. CFFA - Chemical Fabrics and Film Association, Inc.; [www.chemicalfabricsandfilm.com](http://www.chemicalfabricsandfilm.com).
35. CFSEI - Cold-Formed Steel Engineers Institute; [www.cfsei.org](http://www.cfsei.org).
36. CGA - Compressed Gas Association; [www.cganet.com](http://www.cganet.com).
37. CIMA - Cellulose Insulation Manufacturers Association; [www.cellulose.org](http://www.cellulose.org).
38. Cisca - Ceilings & Interior Systems Construction Association; [www.cisca.org](http://www.cisca.org).
39. CISPI - Cast Iron Soil Pipe Institute; [www.cispi.org](http://www.cispi.org).
40. CLFMI - Chain Link Fence Manufacturers Institute; [www.chainlinkinfo.org](http://www.chainlinkinfo.org).
41. CPA - Composite Panel Association; [www.pbmdf.com](http://www.pbmdf.com).
42. CRI - Carpet and Rug Institute (The); [www.carpet-rug.org](http://www.carpet-rug.org).
43. CRRC - Cool Roof Rating Council; [www.coolroofs.org](http://www.coolroofs.org).
44. CRSI - Concrete Reinforcing Steel Institute; [www.crsi.org](http://www.crsi.org).
45. CSI - Construction Specifications Institute (The); [www.csinet.org](http://www.csinet.org).
46. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); [www.cti.org](http://www.cti.org).
47. CWC - Composite Wood Council; (See CPA).
48. DASMA - Door and Access Systems Manufacturers Association; [www.dasma.com](http://www.dasma.com).
49. DHI - Door and Hardware Institute; [www.dhi.org](http://www.dhi.org).
50. ECA - Electronic Components Association; (See ECIA).
51. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
52. EIMA - EIFS Industry Members Association; [www.eima.com](http://www.eima.com).
53. EJMA - Expansion Joint Manufacturers Association, Inc.; [www.ejma.org](http://www.ejma.org).
54. FCI - Fluid Controls Institute; [www.fluidcontrolsintitute.org](http://www.fluidcontrolsintitute.org).
55. FM Approvals - FM Approvals LLC; [www.fmglobal.com](http://www.fmglobal.com).
56. FM Global - FM Global; (Formerly: FMG - FM Global); [www.fmglobal.com](http://www.fmglobal.com).
57. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; [www.floridaroo.com](http://www.floridaroo.com).
58. FSA - Fluid Sealing Association; [www.fluidsealing.com](http://www.fluidsealing.com).
59. FSC - Forest Stewardship Council U.S.; [www.fscus.org](http://www.fscus.org).
60. GA - Gypsum Association; [www.gypsum.org](http://www.gypsum.org).
61. GANA - Glass Association of North America; [www.glasswebsite.com](http://www.glasswebsite.com).
62. GS - Green Seal; [www.greenseal.org](http://www.greenseal.org).
63. HI - Hydraulic Institute; [www.pumps.org](http://www.pumps.org).
64. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
65. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
66. HPVA - Hardwood Plywood & Veneer Association; [www.hpva.org](http://www.hpva.org).
67. IAS - International Accreditation Service; [www.iasonline.org](http://www.iasonline.org).
68. IAS - International Approval Services; (See CSA).
69. ICBO - International Conference of Building Officials; (See ICC).
70. ICC - International Code Council; [www.iccsafe.org](http://www.iccsafe.org).
71. ICEA - Insulated Cable Engineers Association, Inc.; [www.icea.net](http://www.icea.net).
72. ICPA - International Cast Polymer Alliance; [www.icpa-hq.org](http://www.icpa-hq.org).
73. ICRI - International Concrete Repair Institute, Inc.; [www.icri.org](http://www.icri.org).
74. IEC - International Electrotechnical Commission; [www.iec.ch](http://www.iec.ch).
75. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); [www.ieee.org](http://www.ieee.org).
76. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); [www.ies.org](http://www.ies.org).
77. IESNA - Illuminating Engineering Society of North America; (See IES).
78. IEST - Institute of Environmental Sciences and Technology; [www.iest.org](http://www.iest.org).
79. IGMA - Insulating Glass Manufacturers Alliance; [www.igmaonline.org](http://www.igmaonline.org).

80. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); [www.intertek.com](http://www.intertek.com).
81. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); [www.isfanow.org](http://www.isfanow.org).
82. ISO - International Organization for Standardization; [www.iso.org](http://www.iso.org).
83. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
84. ITU - International Telecommunication Union; [www.itu.int/home](http://www.itu.int/home).
85. LMA - Laminating Materials Association; (See CPA).
86. LPI - Lightning Protection Institute; [www.lightning.org](http://www.lightning.org).
87. MBMA - Metal Building Manufacturers Association; [www.mbma.com](http://www.mbma.com).
88. MCA - Metal Construction Association; [www.metalconstruction.org](http://www.metalconstruction.org).
89. MFMA - Maple Flooring Manufacturers Association, Inc.; [www.maplefloor.org](http://www.maplefloor.org).
90. MFMA - Metal Framing Manufacturers Association, Inc.; [www.metalframingmfg.org](http://www.metalframingmfg.org).
91. MHIA - Material Handling Industry of America; [www.mhia.com](http://www.mhia.com).
92. MIA - Marble Institute of America; [www.marble-institute.com](http://www.marble-institute.com).
93. MMPA - Moulding & Millwork Producers Association; [www.wmmpa.com](http://www.wmmpa.com).
94. MPI - Master Painters Institute; [www.paintinfo.com](http://www.paintinfo.com).
95. NAAMM - National Association of Architectural Metal Manufacturers; [www.naamm.org](http://www.naamm.org).
96. NACE - NACE International; (National Association of Corrosion Engineers International); [www.nace.org](http://www.nace.org).
97. NADCA - National Air Duct Cleaners Association; [www.nadca.com](http://www.nadca.com).
98. NAIMA - North American Insulation Manufacturers Association; [www.naima.org](http://www.naima.org).
99. NBGQA - National Building Granite Quarries Association, Inc.; [www.nbgqa.com](http://www.nbgqa.com).
100. NCMA - National Concrete Masonry Association; [www.ncma.org](http://www.ncma.org).
101. NECA - National Electrical Contractors Association; [www.necanet.org](http://www.necanet.org).
102. NeLMA - Northeastern Lumber Manufacturers Association; [www.nelma.org](http://www.nelma.org).
103. NEMA - National Electrical Manufacturers Association; [www.nema.org](http://www.nema.org).
104. NETA - InterNational Electrical Testing Association; [www.netaworld.org](http://www.netaworld.org).
105. NFHS - National Federation of State High School Associations; [www.nfhs.org](http://www.nfhs.org).
106. NFPA - National Fire Protection Association; [www.nfpa.org](http://www.nfpa.org).
107. NFPA - NFPA International; (See NFPA).
108. NFRC - National Fenestration Rating Council; [www.nfrc.org](http://www.nfrc.org).
109. NHLA - National Hardwood Lumber Association; [www.nhla.com](http://www.nhla.com).
110. NLGA - National Lumber Grades Authority; [www.nlga.org](http://www.nlga.org).
111. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
112. NOMMA - National Ornamental & Miscellaneous Metals Association; [www.nomma.org](http://www.nomma.org).
113. NRCA - National Roofing Contractors Association; [www.nrca.net](http://www.nrca.net).
114. NRMCA - National Ready Mixed Concrete Association; [www.nrmca.org](http://www.nrmca.org).
115. NSF - NSF International; [www.nsf.org](http://www.nsf.org).
116. NSPE - National Society of Professional Engineers; [www.nspe.org](http://www.nspe.org).
117. NSSGA - National Stone, Sand & Gravel Association; [www.nssga.org](http://www.nssga.org).
118. NTMA - National Terrazzo & Mosaic Association, Inc. (The); [www.ntma.com](http://www.ntma.com).
119. NWFA - National Wood Flooring Association; [www.nwfa.org](http://www.nwfa.org).
120. PCI - Precast/Prestressed Concrete Institute; [www.pci.org](http://www.pci.org).
121. PDI - Plumbing & Drainage Institute; [www.pdionline.org](http://www.pdionline.org).
122. RCSC - Research Council on Structural Connections; [www.boltcouncil.org](http://www.boltcouncil.org).
123. RFCI - Resilient Floor Covering Institute; [www.rfci.com](http://www.rfci.com).
124. SAE - SAE International; [www.sae.org](http://www.sae.org).
125. SCTE - Society of Cable Telecommunications Engineers; [www.scte.org](http://www.scte.org).
126. SDI - Steel Deck Institute; [www.sdi.org](http://www.sdi.org).
127. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
128. SIA - Security Industry Association; [www.siaonline.org](http://www.siaonline.org).
129. SJI - Steel Joist Institute; [www.steeljoist.org](http://www.steeljoist.org).

130. SMA - Screen Manufacturers Association; [www.smainfo.org](http://www.smainfo.org).
131. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; [www.smacna.org](http://www.smacna.org).
132. SPFA - Spray Polyurethane Foam Alliance; [www.sprayfoam.org](http://www.sprayfoam.org).
133. SPIB - Southern Pine Inspection Bureau; [www.spib.org](http://www.spib.org).
134. SPRI - Single Ply Roofing Industry; [www.spri.org](http://www.spri.org).
135. SRCC - Solar Rating & Certification Corporation; [www.solar-rating.org](http://www.solar-rating.org).
136. SSINA - Specialty Steel Industry of North America; [www.ssina.com](http://www.ssina.com).
137. SSPC - SSPC: The Society for Protective Coatings; [www.sspc.org](http://www.sspc.org).
138. STI - Steel Tank Institute; [www.steeltank.com](http://www.steeltank.com).
139. SWI - Steel Window Institute; [www.steelwindows.com](http://www.steelwindows.com).
140. TCA - Tilt-Up Concrete Association; [www.tilt-up.org](http://www.tilt-up.org).
141. TCNA - Tile Council of North America, Inc.; [www.tileusa.com](http://www.tileusa.com).
142. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); [www.tiaonline.org](http://www.tiaonline.org).
143. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
144. TMS - The Masonry Society; [www.masonrysociety.org](http://www.masonrysociety.org).
145. TPI - Truss Plate Institute; [www.tpinst.org](http://www.tpinst.org).
146. TRI - Tile Roofing Institute; [www.tilerroofing.org](http://www.tilerroofing.org).
147. UL - Underwriters Laboratories Inc.; [www.ul.com](http://www.ul.com).
148. UNI - Uni-Bell PVC Pipe Association; [www.uni-bell.org](http://www.uni-bell.org).
149. USGBC - U.S. Green Building Council; [www.usgbc.org](http://www.usgbc.org).
150. WCLIB - West Coast Lumber Inspection Bureau; [www.wclib.org](http://www.wclib.org).
151. WCMA - Window Covering Manufacturers Association; [www.wcmanet.org](http://www.wcmanet.org).
152. WDMA - Window & Door Manufacturers Association; [www.wdma.com](http://www.wdma.com).
153. WI - Woodwork Institute; [www.wicnet.org](http://www.wicnet.org).
154. WWPA - Western Wood Products Association; [www.wwpa.org](http://www.wwpa.org).

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. IAPMO - International Association of Plumbing and Mechanical Officials; [www.iapmo.org](http://www.iapmo.org).
2. ICC - International Code Council; [www.iccsafe.org](http://www.iccsafe.org).
3. ICC-ES - ICC Evaluation Service, LLC; [www.icc-es.org](http://www.icc-es.org).
4. FBC – Florida Building Code

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; [www.usace.army.mil](http://www.usace.army.mil).
2. CPSC - Consumer Product Safety Commission; [www.cpsc.gov](http://www.cpsc.gov).
3. DOC - Department of Commerce; National Institute of Standards and Technology; [www.nist.gov](http://www.nist.gov).
4. DOD - Department of Defense; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
5. DOE - Department of Energy; [www.energy.gov](http://www.energy.gov).
6. EPA - Environmental Protection Agency; [www.epa.gov](http://www.epa.gov).
7. GSA - General Services Administration; [www.gsa.gov](http://www.gsa.gov).
8. OSHA - Occupational Safety & Health Administration; [www.osha.gov](http://www.osha.gov).
9. SD - Department of State; [www.state.gov](http://www.state.gov).

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10. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; [www.ars.usda.gov](http://www.ars.usda.gov).
11. USDA - Department of Agriculture; Rural Utilities Service; [www.usda.gov](http://www.usda.gov).
12. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; [www.ojp.usdoj.gov](http://www.ojp.usdoj.gov).
13. USPS - United States Postal Service; [www.usps.com](http://www.usps.com).

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; [www.gpo.gov/fdsys](http://www.gpo.gov/fdsys).
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; [www.quicksearch.dla.mil](http://www.quicksearch.dla.mil).
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; [www.access-board.gov](http://www.access-board.gov).
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 42 00

## SECTION 01 45 00 – TESTING LABORATORY SERVICES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SECTION INCLUDES

- A. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - 1. Selection and payment.
  - 2. Quality Assurance.
  - 3. Laboratory reports.
  - 4. Limits on testing laboratory authority.
  - 5. Testing.
  - 6. Preconstruction Testing.

#### 1.3 REFERENCES

- A. ANSI/ASTM D3740 – Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ANSI/ASTM E329 – Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.

#### 1.4 SELECTION AND PAYMENT

- A. Contractor will employ and pay for services of an independent testing laboratory to perform specified inspection and testing.
- B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.
- C. Retest Responsibility: Where results of required inspection, test, or similar service are unsatisfactory (do not indicated compliance of related work with requirements of Contract Documents), retests are responsibility of the Contractor. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work.
  - 1. Arrange with laboratory and pay for additional samples and tests required by Contractor beyond specified requirements, and pay compensation for Architect's additional services made necessary by failed tests and inspections.

#### 1.5 ACTION SUBMITTALS

- A. Schedule of Tests and Inspections: Prepare and submit 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.
- B. Testing service will submit two (2) copies of test reports directly to the Architect from the testing service, with one copy to the Contractor.

#### 1.6 QUALITY ASSURANCE

- A. Laboratory, authorized to operate in State of Florida.
- B. Laboratory maintains a full-time registered Engineer on staff to review services.
- C. Testing Equipment, calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards (NBS) Standards or accepted values of natural physical constants.
- D. Laboratory: Conform to applicable requirements of ASTM C1077 and ASTM E329. Meet "Recommended Requirements for Independent Laboratory Qualifications", published by American Council of Independent Laboratories.
- E. Personnel: Minimum of two (2) years experience performing testing that meets requirements of these Specifications. Agent of laboratory performing field sampling and field testing of concrete shall be certified by the American Concrete Institute (ACI) as a Concrete Field Testing Technician Grade 1, by an equivalent recognized national authority for an equivalent level of competence, or shall be a licensed Professional Engineer.

#### 1.7 LABORATORY REPORTS

- A. Testing service is required to immediately notify Architect of discrepancies observed in the Work performed and to be performed in accordance to the Contract Documents.
- B. After each inspection and test, submit 2-copies of laboratory report to Owner, Architect, and Contractor.
- C. Provide where required by Specification 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 reinspecting.

- 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.

#### 1.8 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. Laboratory may not approve or accept any portion of the Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop the Work.

#### 1.9 TESTING

A. Contractor Responsibilities:

1. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspecting will be performed.
2. Deliver to laboratory at designated location, adequate samples of materials used, which require testing, along with proposed mix designs.
3. Cooperate with laboratory personnel, and provide access to the Work and to manufacturer's facilities.
4. Provide incidental labor and facilities to provide access to Work to be tested, to obtain, and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
5. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
6. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
7. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
8. Employ and pay for the services of Testing Laboratory to perform additional inspections, sampling and testing required:
  - a. For the Contractor's convenience.
  - b. When initial tests indicate work does not comply with Contract Documents.
  - c. Make arrangements with Laboratory and pay for additional samples and tests required for Contractor's convenience.
9. Do not place or install any material which does not meet specified requirements. Do not place or install any material over or on a substrate that has not met test requirements.

- B. Testing Agency Responsibilities: Cooperate with Architect Commissioning Authority and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect, Commissioning Authority and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Cooperate with Architect, Engineer and Contractor; provide qualified personnel after due notice.
3. Perform specified inspections, sampling and testing of materials and methods of construction.
  - a. Comply with specified standards.
  - b. Ascertain compliance of materials with requirements of Contract Documents.
  - c. Utilize properly calibrated equipment, calibrated within past twelve (12) months by devices of accuracy conforming to National Bureau of Standards or within accepted values of natural physical constants.
4. Perform additional test(s) as required by Architect or Owner.
5. Submittals: Submit qualifications of technicians, inspectors, engineers and the organization to perform services for this Project. Include copies of certificates and license numbers to confirm compliance.
6. Keep time and cost separate for additional testing and inspection as outlined herein. Notify the Architect of additional testing and inspection required.
7. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
8. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
9. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
10. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
11. Do not perform any duties of Contractor.
12. 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.
  - a. Schedule times for tests, inspections, obtaining samples, and similar activities.
  - b. Testing requirements indicated in specific specification sections shall take precedence over testing requirements indicate in this section which relate to the same specific specification section.
13. 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.
  - a. Distribution: Distribute schedule to Owner, Architect, Commissioning Authority, Contractor testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

#### 1.10 PRECONSTRUCTION TESTING

- A. 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 and Commissioning Authority, through Contractor.

#### 1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
- B. Special Tests and Inspections: Conducted by a qualified testing agency or 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 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 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 reinspecting corrected work.
  7. Special Testing or Inspections required:
    - a. Test No. 1
    - b. Inspection No. 1.

#### 1.12 SOIL COMPACTION TESTING

- A. The Contractor for the work of specification section – Earth Moving, shall coordinate with soil testing and inspection service for quality control testing during earthwork operations and shall follow testing required in the Earthwork section and if none is indicated provide the following:
1. Field density test reports.
  2. One optimum moisture-maximum density curve for each type of soil encountered or utilized.
  3. The Contractor shall cooperate and coordinate with Soils Engineer to be on the site for observation and testing during times when the following operations are being performed.
    - a. Proofrolling
    - b. Compaction of areas of subgrades and fill. During compaction operations, the Soils Engineer shall also carefully monitor existing foundations to detect possible foundation movements. If movement is detected, Work shall be stopped and the Architect immediately notified.
  4. Testing service must inspect and approve subgrades and fill layers before further construction work is performed thereon.

- a. Testing service will secure representative samples of the existing soils or fill material and determine the Standard Density and required moisture content to be maintained by the Moisture-Density Relation Test ASTM D-1557.
  - b. Perform field density tests in accordance with ASTM D-1556 (sand cone method) or by approved nuclear density testing method, as applicable.
  - c. Perform Limerock Bearing Ratio (LBR) tests in accordance with applicable FDOT Standards for Testing, Latest Edition, and FDOT FM 5-517.
- B. Quality Control Testing During Construction: Testing service must inspect and approve subgrades and fill layers before further construction work is performed thereon. Tests of subgrades and fill layers will be taken as follows:
1. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to Architect, except that a minimum of one test shall be performed for each 15,000 square feet of building area.
  2. Building Slab Subgrade: Make at least one field density test of subgrade for every 2,000 square feet of building slab, but in no case less than 3 tests. In each compacted fill layer, make one field density test for every 2,000 square feet of overlaying building slab area, but in no case less than 3 tests.
  3. Foundation and Retaining Wall Backfill: Take at least 2 field density tests, at locations and elevations as directed.
  4. Paved Areas: Make at least one field density test of the subgrade for every 2,000 square feet, or portion thereof, of paved area, but in no case less than 3 tests shall be made for each day's final compaction operations. On each compacted fill layer, make at least one field density test for every 2,000 square feet, or portion thereof, of overlaying paved area, but in no case less than 3 tests shall be made for each day's final compaction operations. When stabilized subgrade is indicated on the Drawings, make at least one Limerock Bearing Ratio test of the subgrade for every 2,000 square feet, or portion thereof, but in no case less than 3 test shall be made for each day's final stabilizing operations.
  5. Stabilized Shoulders: Make at least one field density test for every 200 lineal feet, or portion thereof, of stabilized shoulders staggered every 100 feet on either side of the roadway, but in no case less than 3 tests shall be made for each day's final compaction operations. Make at least one Limerock Bearing Ratio test for every 200 lineal feet, or portion thereof, of stabilized shoulders staggered every 100 feet on either side of the roadway, but in no case less than 3 tests shall be made for each day's final stabilizing operations.
  6. Potable Water, Sanitary Sewer and Storm Drain Pipe Trench Backfill: Make at least one field density test on each 12" layer (lift) of trench backfill from the top of the pipe to the bottom of the subgrade or finished ground, as appropriate.
    - a. As a minimum, provide at least one test for each 12" layer, for every 200 lineal feet or portion thereof of pipe trench.
    - b. In addition, provide at least one test for each 12" layer, for every section of sanitary/storm pipe trench between structures.
    - c. In addition, provide at least one test for each 12" layer, for every pipe trench crossing an existing or proposed road perpendicular to the centerline of the road.
- C. If, in the opinion of the Architect, based on reports of testing service and inspection, subgrade or fills which have been placed are below specified density, additional compaction work and testing shall be provided by the Contractor for the Section of Work involved at no additional expense, until subgrades or fills meet or exceed specified density.

1.13 ASPHALTIC CONCRETE PAVEMENT TESTING

- A. The Contractor for the work of specification section – “Concrete Paving” shall coordinate with a separate testing laboratory to perform field quality control and shall follow testing required in the Asphaltic Concrete section and if none is indicated provide the following.
- B. Test uncompacted asphalt concrete mix and report the following:
  - 1. Sampling: AASHTO T168 (ASTM D979) and F.D.O.T. Specifications.
  - 2. Asphalt Cement Content: AASHTO T164 (ASTM D2172) and F.D.O.T. Specifications.
  - 3. Perform at least one initial test for paving, unless otherwise specified or directed.
- C. Test in-place, compacted pavement for density and thickness, as specified. Perform one test for each 2,000 square feet but not less than one test per day, unless otherwise specified or directed.
- D. The Contractor shall pay for and perform additional Work and testing as may be required if any of the previous tests indicate insufficient values or if directed by the Architect. Continue Work and testing until specified values have been attained.
- E. Asphalt concrete material not complying with specified requirements will not be acceptable. The Contractor shall repair or remove and replace defective paving as directed by the Architect, at no additional cost to the Owner.
- F. Record the locations where samples are taken to correlate with subsequent testing.

1.14 CONCRETE TESTING

- A. The Contractor for the Work of specification section – “Cast In Place Concrete,” shall coordinate with a separate testing laboratory to perform field quality control testing during concrete work under Division 3 and shall follow testing required in the Cast-In-Place Concrete section and if none is indicated provide the following:
- B. Quality Control Testing During Construction: Perform sampling and testing for field quality control during the placement of concrete, as follows:
  - 1. Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C94.
  - 2. Slump: ASTM C143, one test for each concrete load at point of discharge, and one for each set of compressive strength test specimens.
  - 3. Air Content: ASTM C231, pressure method; one for every other concrete load at point of discharge or when the indication of change requires.
  - 4. Compression Test Specimens: ASTM C31, one set of 6 standard cylinders for each compressive strength test, unless otherwise directed.
    - a. Cast and store 3 cylinders for laboratory cured test specimens and 3 field-cured test specimens as specified in ASTM C31.
  - 5. Concrete Temperature: Test hourly when air temperature is 40 degrees F. and below and when 80 degrees F. and above; and each time a set of compressive test specimens is made.
  - 6. Compressive Strength Tests: ASTM C39, one set for each 50 cu.yds. or fraction thereof, of each mix design placed in a day or for each 5,000 sq.ft. of surface area placed; 2 specimens (one field cured and one lab cured) tested at 7 days, 2 specimens (one field cured and one lab cured) tested at 28 days, and 2 specimens (one field cured and one lab cured) retained in reserve for later testing if required.

- a. When the frequency of testing will provide less than 5 strength tests for a given mix design, conduct testing strength tests for a given mix design, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
  - b. When the strength of field cured cylinders is less than 85 percent of companion laboratory cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
- C. Report test results in writing to the Architect, Engineer, Contractor, and ready-mix supplier on the same day that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of Contractor, name of concrete supplier and truck number, name of concrete testing service, concrete type and class, location of concrete batch in the structure, design compressive strength at 28 days, concrete mix proportions and materials, type and amount of fibrous reinforcement, compressive breaking strength, and type of break for both 7 day tests and 28 day tests.
- D. Additional Tests: The testing service will make additional tests of in-place concrete, as directed by the Architect, when test results indicate the specified concrete strengths and other characteristics have not been attained in the structure. The testing service shall conduct tests to determine the strength and other characteristics of the in-place concrete by compression tests on cored cylinders complying with ASTM C42 or by load testing specified in ACI 318 or other acceptable nondestructive testing methods, as directed. The Contractor shall pay for such tests conducted and any other additional testing as may be required, when unacceptable concrete is verified.
- E. Evaluation of Quality Control Tests: Do not use concrete delivered to the final point of placement which has slump or total air content outside the specified values.
1. Compressive strength tests for laboratory-cured cylinders will be considered satisfactory if the averages of all sets of three consecutive compressive strength tests results equal or exceed the 28 day design compressive strength of the type or class of concrete; and no individual strength test falls below the required compressive strength by more than 500 psi.
  2. Strength tests of specimens cured under field conditions may be required by the Architect to check the adequacy of curing and protecting of the concrete placed. Specimens shall be molded by the field quality control laboratory at the same time and from the same samples as the laboratory cured specimens.
    - a. Provide improved means and procedures for protecting concrete when the 28 day compressive strength of field cured cylinders is less than 85 percent of companion laboratory cured cylinders.
    - b. When laboratory cured cylinder strengths are appreciably higher than the minimum required compressive strength, field cured cylinder strengths need not exceed the minimum required compressive strength by more than 500 psi even though the 85 percent criterion is not met.
    - c. If individual tests of laboratory cured specimen produce strengths more than 500 psi below the required minimum compressive strength or if tests of field cured cylinders indicates deficiencies in protection and curing, provide additional measures to assure that the load-bearing capacity of the structure is not jeopardized. If the likelihood of low-strength concrete is confirmed and computations indicate the load-bearing capacity may have been significantly reduced, tests of cores drilled from the area in question may be required.
  3. If the compressive strength tests fail to meet the minimum requirements specified, the concrete represented by such tests will be considered deficient in strength.
- F. Deficient concrete shall be removed and replaced by the Contractor without additional cost to the Owner.

1.15 CONCRETE MATERIALS AND MIX DESIGN

- A. Concrete Materials and Mix Design: The Contractor shall provide the following in conformance with the requirements of specification section "Cast In Place Concrete" and shall follow testing required in the Cast In Place Concrete section and if none is indicated provide the following:
1. Ready-mixed concrete shall be mixed and delivered in accordance with ASTM C94.
  2. Product Data: Submit 2 copies of manufacturer's specifications with application and installation instructions for proprietary materials and items, including admixtures, bonding agents, waterstops, joint systems, chemical floor hardeners, and dry shake finish materials.
  3. Laboratory Test Reports: Submit 2 copies of laboratory test reports for concrete materials and mix design tests. The Architect's review will be for general information only. Production of concrete to comply with specified requirements is the Contractor's responsibility.
  4. Mix Design: Submit 6 copies of concrete mix designs for each type of mix required by the Concrete Schedule indicating the amount of each ingredient (by weight) in one cubic yard of concrete, the calculated water/cement ratio, and the slump.
- B. Tests for Concrete Materials
1. For normal weight concrete, test aggregates by the methods of sampling and testing of ASTM C33.
  2. For lightweight concrete, test aggregates by the methods of sampling and testing of ASTM C330.
  3. For portland cement, sample the cement and determine the properties by the methods of test of ASTM C33.
  4. Submit written reports for each material sampled and tested, prior to the start of Work. Provide the project identification name and number, date of report, name of Contractor, name of concrete testing service, source of concrete aggregates, material manufacturer and brand name for manufactured materials, values specified in the referenced specification for each material, and test results. Indicate whether or not material is acceptable for intended use.
- C. Submit signed statement from ready-mix plant that concrete furnished for the Project will exactly conform to the approved design mixes.

1.16 WELDING QUALITY CONTROL

- A. Welding operators shall be qualified under the provisions of the AWS Structural Welding Code, on test pieces in positions and with clearances equivalent to those actually to be encountered in construction and shall follow testing required in the applicable section and if none is indicated provide the following;
- B. Welds requiring inspection shall be so indicated in the drawings.
1. Welds indicted as requiring visual inspection shall be visually inspected by an independent inspector, acceptable to the Architect, prequalified to make the weld being inspected. Welders and inspectors shall be prequalified by the American Welding Society Qualification Test.
- C. The Contractor performing the welding requiring inspection shall coordinate with an independent testing service, acceptable to the Architect to perform weld testing.

- D. Submit written reports for each weld tested. Provide project identification and number, date of report, name of Welding Contractor, name of testing service, location of weld, type of weld, and test results. Indicate whether or not weld is acceptable for intended use.
- E. If by inspection welds fail to meet minimum acceptable criteria, the welds shall be cut out and replaced.
- F. Welders shall make only those types of welds for which they are specifically certified.

#### 1.17 BOLTED STRUCTURAL CONNECTIONS QUALITY CONTROL

- A. The Contractor for the work in specification section – “Structural Steel Framing” shall coordinate with a separate testing laboratory, to perform field quality control inspection of slip-critical and snug-tight bolted connections and shall follow testing required in the applicable section and if none is indicated provide the following;
- B. Inspection of slip-critical connections shall be visual. The inspector shall be present at the beginning of steel erection to insure that the erector is conforming to the Contract Documents and AISC Specifications. The inspector shall verify that the erector is marking the bolts and nuts prior to the turn-of-nut procedure. Ten percent of all slip-critical bolted connections shall be observed as they are installed. Any connections which, in the opinion of the inspector, do not meet the tightening requirements of the Contract Documents shall be corrected by the erector.
  - 1. Inspection of snug-tight connections shall be made by use of a spud wrench. Ten percent of all snug-tight bolted connections selected randomly over the entire limits of the building structure shall be tested to verify tightness. If more than 20 percent of the bolts tested do not meet the General Requirements of the Contract Documents, the erector shall be required to retighten all snug-tight bolted connections on the Project.

#### PART 2 - PRODUCTS (Not Applicable)

#### PART 3 - EXECUTION

##### 3.1 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample-taking, and similar services performed on Work, repair damaged Work and restore substrates and finishes to eliminate deficiencies including defects in visual qualities of exposed finishes. Except as otherwise indicated, comply with requirements of Contract Documents. Protect Work exposed by or for service activities and protect repaired Work. Repair and protection is Contractor's responsibility, regardless of assignment of responsibility for inspection, testing, or similar service.

END OF SECTION 01 45 00



## SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

#### 1.3 USE CHARGES

- A. General: Installation and removal of and use charges for all temporary utility facilities and services 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, Architect, testing agencies, and authorities having jurisdiction.
- B. Water Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

#### 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 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
  - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.

2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
  3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
1. Locations of dust-control partitions at each phase of work.
  2. HVAC system isolation schematic drawing.
  3. Location of proposed air-filtration system discharge.
  4. Waste handling procedures.
  5. Other dust-control measures.

## 1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

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

1. Screening: Provide UV protected 2 ply windscreens in green color at chain link fencing.
- C. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- D. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.
- E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

## 2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Contractor, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
  1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
  2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
  3. Drinking water and private toilet.
  4. Coffee machine and supplies.
  5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
  6. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
  1. Store combustible materials apart from building.

## 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in specification section "Closeout Procedures."
- C. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- D. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

### 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 Specification 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.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. Provide connections and extensions of services as required for construction operations. At Substantial Completion, restore these facilities to condition existing before initial use and provide test as required by Building Official.
  1. Provide meter, Owner to pay service charges.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
  1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
  - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
    - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
    - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
  - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
  - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
  - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- H. Electric Power Service: Connect to Owner's existing electric power service as directed by the owner. Provide connections and extensions of services as required for construction operations. Maintain equipment in a condition acceptable to Owner.
  - 1. No meter, Owner to pay service charges.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
  - 1. At each telephone, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Contractor's emergency after-hours telephone number.
    - e. Architect's office.
    - f. Engineers' offices.
    - g. Owner's office.
    - h. Principal subcontractors' field and home offices.

2. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
- K. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:
1. Processor: Intel Pentium D or Intel CoreDuo, 3.0 GHz processing speed.
  2. Memory: 4 gigabyte.
  3. Disk Storage: 300 gigabyte hard-disk drive and combination DVD-RW/CD-RW drive.
  4. Display: 22-inch LCD monitor with 256-Mb dedicated video RAM.
  5. Full-size keyboard and mouse.
  6. Network Connectivity: 10/100BaseT Ethernet.
  7. Operating System: Microsoft Windows XP Professional or Microsoft Windows Vista Business.
  8. Productivity Software:
    - a. Microsoft Office Professional, XP or higher, including Word, Excel, and Outlook.
    - b. Adobe Reader 7.0 or higher.
    - c. WinZip 7.0 or higher.
  9. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying, scanning, and faxing, or separate units for each of these three functions.
  10. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Provide construction for temporary offices, shops, and sheds located within construction area that is noncombustible according to ASTM E 136. Comply with NFPA 241.
  2. Maintain support facilities until Architect 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.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas on Drawings.
1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
  2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to specification section "Earth Moving."
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Maintain access for fire-fighting equipment and access to fire hydrants.
  - E. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
  - F. Any grounds within the designated construction zone, staging area, administrative area, etc. will be maintained by the CM in a neat and reasonable appearance, including the removal of all debris, management of stored materials, mowing of grass, control of erosion, etc.
  - G. Drainage: 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.
  - H. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
    1. Identification Signs: Provide Project identification signs as indicated.
    2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
    3. Provide temporary, directional signs for construction personnel and visitors.
    4. Maintain and touchup signs so they are legible at all times.
  - I. Waste Disposal Facilities: Comply with requirements specified in specification section "Construction Waste Management and Disposal."
  - J. 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 specification section "Execution."
  - K. 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.
  - 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 requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
    1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.

2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
  3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
  4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- 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: 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.
- F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
  2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- H. 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.
- I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- J. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- K. 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.
- L. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by from fumes and noise.
1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.



2. Construct dustproof partitions with two layers of 6-mil polyethylene sheet on each side. Cover floor with two layers of 6-mil 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.
  3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
  4. Insulate partitions to control noise transmission to occupied areas.
  5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
  6. Protect air-handling equipment.
  7. Provide walk-off mats at each entrance through temporary partition.
- M. 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 -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.
    - c. Remove materials that cannot 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 Specification Section "Closeout Procedures."

END OF SECTION 01 50 00

## SECTION 01 50 10 – PROJECT CONSTRUCTION SIGN

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Requirements for Project Construction Sign.
- B. General Requirements: Comply with the following:
  - 1. Schedule for Sign: Erect Project sign at the beginning of construction and it shall remain in-place until Certificate of Occupancy has been issued.
  - 2. Location of Project Sign: Unless otherwise directed by Owner, Project sign shall be erected at a location that is visible to the public, which typically is adjacent to the entrance drive of the Project site, and approved by the Architect.
    - a. Bottom face of the Project sign shall be a minimum of 4 ft. above grade.
  - 3. Other Site Signs: Unless required by local, state, or Federal Code or safety standards, no other signs will be permitted at the Project site.

#### 1.3 ACTION SUBMITTALS

- A. Signage Information: Architect will provide information for the Project sign electronically.
  - 1. Architect will review with the designated Owner's Representative that the indicated information is correct.
  - 2. Sign fabricator shall be responsible for ensuring that the correct information is indicated on the Project sign.

#### 1.4 QUALITY ASSURANCE

- A. Code Requirement: Project sign shall comply with all applicable Codes, including wind load recommendations and requirements.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Construct Project sign of the following:

St. Johns River State College  
Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

1. Plywood Sign Faces: 2, 4 ft. x 8 ft. x 3/4 inch thick, exterior grade plywood.
  - a. Plywood faces shall be constructed into a "V" format on a 90-degree angle.
  - b. Design to be provided by the Architect and Owner approved.
2. Posts: Not less than 2 posts per 4 ft. x 8 ft. sign face.
  - a. Size of Posts: As required per Florida Building Code wind load requirements.
  - b. Material: Posts may be fabricated of exterior grade, treated lumber or galvanized steel.
3. Fasteners: Use fasteners that are zinc-coated to inhibit rust.
  - a. Number of Fasteners: As required by structural requirements.

## 2.2 FABRICATION

- A. Project sign shall be fabricated off-site and match the example and brought to the Project site ready for erection in location as directed by Architect.

## PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 50 10

## SECTION 01 56 39 - TEMPORARY TREE AND PLANT PROTECTION

### 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 general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.
- B. Related Requirements:
  - 1. Section 01 50 00 "Temporary Facilities and Controls" for temporary site fencing.
  - 2. Section 31 10 00 "Site Clearing" for removing existing trees and shrubs.

#### 1.3 DEFINITIONS

- A. Caliper: Diameter of a trunk measured by a diameter tape or the average of the smallest and largest diameters at a height 6 inches above the ground for trees up to and including 4-inch size at this height and as measured at a height of 12 inches above the ground for trees larger than 4-inch size.
- B. Caliper (DBH): Diameter breast height; diameter of a trunk as measured by a diameter tape or the average of the smallest and largest diameters at a height 54 inches above the ground line.
- C. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.
- D. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and indicated on Drawings. For protected trees not indicated, use the tree canopy dripline as the minimum protected area.
- E. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

#### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:
    - a. Tree-service firm's personnel, and equipment needed to make progress and avoid delays.

- b. Arborist's responsibilities.
- c. Quality-control program.
- d. Coordination of Work and equipment movement with the locations of protection zones.
- e. Trenching by hand or with air spade within protection zones.
- f. Field quality control.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
  - 1. Include plans, elevations, sections, and locations of protection-zone fencing, showing relation of equipment-movement routes and material storage locations with protection zones.
- C. Sample: For the following:
  - 1. Organic Mulch: 1-pint volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
- D. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.
  - 1. Species and size of tree.
  - 2. Location on site plan. Include unique identifier for each.
  - 3. Reason for pruning.
  - 4. Description of pruning to be performed.
  - 5. Description of maintenance following pruning.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For arborist and tree service firm.
- B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.
- D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
  - 1. Use sufficiently detailed photographs or video recordings.
  - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- E. Quality-control program.

1.7 QUALITY ASSURANCE

- A. Arborist Qualifications: Certified Arborist as certified by ISA.
- B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.
- C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection zone fencing and signage, the arborist's and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.8 FIELD CONDITIONS

- A. The following practices are prohibited within protection zones:
  - 1. Storage of construction materials, debris, or excavated material.
  - 2. Moving or parking vehicles or equipment.
  - 3. Foot traffic.
  - 4. Erection of sheds or structures.
  - 5. Impoundment of water.
  - 6. Excavation or other digging unless otherwise indicated.
  - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Backfill Soil: Excavated soil mixed with compost, of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clay lumps, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
  - 1. Mixture: Blended mix of 90% excavated soil and 10% compost.
- B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:
  - 1. Type: Shredded hardwood, shredded bark, or bark chips.
  - 2. Size Range: 3 inches maximum, 1/2 inch minimum.
  - 3. Color: Natural.

- C. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements:
1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a minimum of 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by treated posts and rails, with posts spaced not more than 96 inches apart.
    - a. Height: 48 inches.
    - b. Color: High-visibility orange, nonfading.
  2. Gates: Double swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones; leaf width 36 inches.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

#### 3.2 PREPARATION

- A. Locate and clearly identify trees, shrubs, and other vegetation to remain. Tie a 1-inch green vinyl tape around each tree trunk in a visible location.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.
- C. Tree-Protection Zones: Mulch existing bed areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.
  1. Apply 3-inch uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.

#### 3.3 PROTECTION ZONES

- A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where



fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

1. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.
  2. Access Gates: Install for convenient access by mowers; adjust to operate smoothly, easily, and quietly; free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.
- B. Maintain protection zones free of weeds and trash. Keep the grass mowed to 3 to 4-inch height.
- C. Maintain protection-zone fencing in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.
1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
  2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

### 3.4 EXCAVATION

- A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 31 20 00 "Earth Moving" unless otherwise indicated.
- B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.
- C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.
- D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

### 3.5 ROOT PRUNING

- A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Cut Ends: Do not paint cut root ends.
3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
4. Cover exposed roots with burlap and water regularly.
5. Backfill as soon as possible according to requirements in Section 31 20 00 "Earth Moving."

- B. Root Pruning at Edge of Protection Zone: Prune tree roots 12 inches outside of the protection zone by cleanly cutting all roots to the depth of the required excavation.

### 3.6 CROWN PRUNING

- A. Prune branches that are affected by temporary and permanent construction. Prune branches as directed by arborist.
1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
  2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
  3. Pruning Standards: Prune trees according to ANSI A300 (Part 1).
- B. Unless otherwise directed by arborist and acceptable to Architect, do not cut tree leaders.
- C. Cut branches with sharp pruning instruments; do not break or chop.
- D. Do not paint or apply sealants to wounds.
- E. Provide subsequent maintenance pruning during Contract period as recommended by arborist.
- F. Pick up removed branches and dispose of off-site.

### 3.7 REGRADING

- A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.
- B. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

### 3.8 FIELD QUALITY CONTROL

- A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

### 3.9 REPAIR AND REPLACEMENT

- A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Architect.
  - 1. Submit details of proposed pruning and repairs.
  - 2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
  - 3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.
  
- B. Trees: Remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.
  - 1. Small Trees: Provide new trees of same size and species as those being replaced for each tree that measures 4 inches or smaller in caliper size.
  - 2. Large Trees: Provide two new trees of 4-inch caliper size for each tree being replaced that measures more than 4 inches in caliper size.
    - a. Species: As selected by Architect.
  - 3. Plant and maintain new trees as specified in Section 32 93 00 "Plants."
  
- C. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 4-inch uniform thickness to remain.
  
- D. Soil Aeration: Where directed by Architect, aerate surface soil compacted during construction. Aerate 10 feet beyond drip line and no closer than 3 feet to tree trunk. Use an aerating roller with spikes not in excess of 8 inches long. Avoid damage to the irrigation system and other surface features.

### 3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 01 56 39



## SECTION 01 60 00 – PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 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. 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's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within fifteen (15) work days of receipt of request, or seven calendar days of receipt of additional information or documentation, whichever is later.
  - a. Form of Approval: As specified in specification section "Submittal Procedures."
  - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

- B. Basis-of-Design Product Specification Submittal: Comply with requirements in specification 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. Contractor is responsible for providing products and construction methods compatible with products and construction methods of applicable subcontractors.

#### 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. See other Sections for specific content requirements and particular requirements for submitting special warranties.

## 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 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. **Non-restricted 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's sample", provide a product that complies with requirements and matches Architect's sample. Architect'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 Specification 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 will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 60 00



## SECTION 01 73 00 – EXECUTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 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. Coordination of Owner-installed products. Starting and adjusting.
  - 5. Protection of installed construction.
  - 6. Correction of the Work.

#### 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. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Certified Surveys: Submit two (2) copies signed by land surveyor.
- D. Final Property Survey: Submit ten (10) copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other sections.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. 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.
- B. 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.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. 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.

- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on drawings.
- C. 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 according to requirements in specification 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 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.

### 3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. 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.
- C. 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.
- D. 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.
  3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- 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.
  - 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 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in specification 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 specification section "Quality Requirements."

### 3.7 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 01 73 00



## SECTION 01 73 10 – CUTTING AND PATCHING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.

#### 1.3 DEFINITIONS

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

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 10 work 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.

#### 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 of locations and details of cutting and await directions from Architect 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. Operational elements include the following:
    - a. Primary operational systems and equipment.
    - b. Fire separation assemblies.
    - c. Air or smoke barriers.
    - d. Fire-suppression systems.
    - e. Mechanical systems piping and ducts.
    - f. Control systems.
    - g. Communication systems.
    - h. Fire-detection and -alarm systems.
    - i. Conveying systems.
    - j. Electrical wiring systems.
    - k. 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. Other construction elements include but are not limited to the following:
    - a. Water, moisture, or vapor barriers.
    - b. Membranes and flashings.
    - c. Exterior curtain-wall construction.
    - d. Sprayed fire-resistive material.
    - e. Equipment supports.
    - f. Piping, ductwork, vessels, and equipment.
    - g. Noise- and vibration-control elements and systems.
    - h. Firestopping
  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's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.
- 1.6 WARRANTY
- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.
  - B. Extend a one-year labor and materials warranty against defects in failure of patch work due to material defects or workmanship.



## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing 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 sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  - 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. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing 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.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid or minimize interruption of services to occupied areas. Schedule any such interruptions of service with Owner.

### 3.3 EXECUTION

- A. Comply with requirements in specification section "Selective Demolition."
- B. 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 according to requirements in specification section "Project Management and Coordination."
- C. 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.
- D. 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 minimize interruption to occupied areas.
- E. 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.
- F. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on drawings.
- G. 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.
- H. 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.

- I. Temporary Support: Provide temporary support of work to be cut.
  
- J. 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 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.
  
- K. 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.
  - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, appearance.
    - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  - 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
  
- L. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.
  - 1. patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color.

END OF SECTION 01 73 10



## SECTION 01 73 20 – INDOOR AIR QUALITY (IAQ) MANAGEMENT PLAN

### 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 requirements and procedures for achieving acceptable indoor air quality for the interior areas of this Project during construction, and preventing contamination of ductwork, HVAC equipment, and other building materials to avoid IAQ problems for workers and for occupants in the future after occupancy. Work includes requirements on the use of permanent building mechanical systems prior to Owner's acceptance.
- B. Comply with requirements for Construction Indoor Air Quality Management, During Construction and as specified in specification section "Green Building Initiative Requirements" and in this section.
- C. Contractor shall prepare and submit an Indoor Air Quality (IAQ) Management Plan.

#### 1.3 ACTION SUBMITTALS

- A. IAQ Construction Management Plan: Submit 3 Copies of the plan within 30 days of the date established for commencement of the Work. Update and resubmit plan as required during construction process to reflect Project conditions.
- B. Meeting Minutes: Submit minutes from the Contractor meetings related to the execution and verification of the IAQ Construction Management Plan.
- C. Date Stamped Record Photographs: Provide at a minimum of 3 stages of construction to document adherence with the IAQ requirements. A minimum of 45 photographs, 15 photographs taken at the three different stages of construction when IAQ Construction Management Plan procedures are active. Provide 3 photographs of each of the five SMACNA IAQ requirements at each stage of construction. Provide identification of the 5 SMACNA requirements for each photo to document consistent adherence to requirements of Construction Indoor Air Quality Management, During Construction.
- D. Product Data: Submit cut sheets of filtration media proposed for use.

#### 1.4 QUALITY ASSURANCE

- A. Contractor's Construction IAQ Management Plan shall meet or exceed the 5 recommended design approaches of SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction

2<sup>nd</sup> Edition 2007, ANSI/SMACNA 008-2008, (Chapter 3), and shall embody the principals and practices set forth in this Section.

- B. IAQ Management Conference: Conduct conference at Project site to comply with the requirements in Division 1 Section "Project Management and Coordination."
  - 1. Review methods and procedures related to IAQ management during construction.
  - 2. Review IAQ management requirements with each trade.
- C. Comply with the requirements Construction Indoor Air Quality Management, During Construction and Contractor's Construction IAQ Management Plan during construction.

#### 1.5 IAQ CONSTRUCTION MANAGEMENT PLAN

- A. Contractor IAQ Construction Management Plan shall include procedures to prevent indoor air quality problems resulting from the construction process in order to help sustain the comfort and well being of construction workers and future building occupants.
- B. Contractor's detailed plan shall be based on the particular characteristics of the Project.

#### PART 2 - PRODUCTS (Not Applicable)

#### PART 3 - EXECUTION

##### 3.1 HVAC PROTECTION (SMACNA Approach number 1)

- A. Store HVAC equipment including but not limited to items such as ducting, registers, air handler components, fans, and motors in a clean, dry location, protected from dust and other contaminants, and covered with plastic until installed.
- B. Seal all HVAC inlets and outlets.
- C. Use of the HVAC system shall be avoided during construction, until drywall construction and activities that produce dust or particulate pollution have been completed. Temporary ventilation may be installed to remove contaminants. All HVAC components including but is not limited to outside air inlets, grills, diffusers, supply ducts, return ducts, ceiling plenums, VAV (variable air volume) plenum intakes, and window ventilator or air conditioning units shall be sealed during construction.
- D. Seal HVAC components during installation. Ducts runs that require several days to install, sections shall be sealed off as they are completed. Seals shall be removed prior to continuing the duct run. Other components of the HVAC system shall be subject to the same requirements to protect from contamination.
- E. Provide frequent inspection and maintenance, of HVAC component protection. Replace as necessary. If inspections by the Architect, Engineer, Owner, or Commissioning Agent reveal that the ductwork has been contaminated due to inadequate protection, the ductwork shall be cleaned professionally prior to activation the HVAC system or occupancy, using procedures established in ACR 2005 published by the National Air Duct Cleaners Association. HVAC components have been damaged or contaminated shall be cleaned or replaced as necessary.

- F. Use temporary filtration media. If HCAC system is to be used while construction work is being done, temporary media filtration media shall be installed on all air intakes. Such filtration shall have a minimum filtration efficiency (Minimum Efficiency Reporting Value-MERV per ASHRAE 52.2) of 8. For air intakes into other parts of the building that are very sensitive, such as computer rooms, filtration media with a MERV rating of 13 or higher is required.
- G. Inspect filters weekly replace as needed for proper filtration and air flow.
- H. Avoid contamination of air entry into enclosed parts of the building. When outdoor construction activities generate dust, combustion emissions, or other contaminants, operable windows and outside air supplies to enclosed portions of the building will be closed or sealed.
- I. Do not use fan, mechanical, or electrical rooms to store construction or waste materials. Keep these rooms clean and neat.
- J. Ceiling tiles shall not be installed until after drywall and painting is complete to avoid contamination of ceiling tiles that will form the return air plenum.

### 3.2 SOURCE CONTROL (SMACNA Approach number 2)

- A. The use of moisture-damaged materials shall not be allowed. Any porous materials that have become wet shall be dried thoroughly within 48 hours and before installation. Any materials damaged, showing visible mold, or that are wet for over 48 hours shall be removed from the site appropriately.
- B. Contractor to ensure that the construction process will not result in moisture intrusion. In the event of rain or groundwater intrusions notify the Owner's representative.
- C. Avoid tracking pollutants into the work areas.
  - 1. At the start of framing and mechanical system installation access to the building shall be controlled to minimize the tracking of contaminants.
  - 2. Material deliveries and construction waste removal shall be routed by the most direct route to and from the building exterior.
  - 3. Provide rough track off grates or matting at the entryway to remove moisture and contaminants from pedestrian traffic.
  - 4. Prevent the ingress of rodents and pests.
  - 5. Food and drinks other than water shall not be allowed in the building.
  - 6. Trash containers will be primarily located outside of the building. Any interior trash containers will be emptied twice a week at a minimum.
  - 7. Use procedures to insure that there is no smoking in the building, storage areas of absorptive materials, or within 25 ft of air intakes or building openings.
- D. Limit construction traffic and monitor idling vehicles and equipment in the vicinity of air intakes when the HVAC systems are activated. Restrict vehicles to a loading area, well removed from air intakes. Prevent emissions from being drawn into the building.
- E. Use electric or natural gas alternatives to for gasoline and diesel equipment when possible.
- F. All personnel lifts used inside the building will be electrically operated to prevent emissions inside the building.

- G. Cycle vehicles and equipment off when not being used.
- H. Avoid the use of materials and products with high VOC and particulate levels. Inside the building use products and installation methods with low VOCs such as paints and coatings, adhesives and sealants, and cleaners.
- I. The project's specifications guidelines call for the use of low-VOC materials. Daily inspections will be made by the Contractor's project manager and/or superintendent to ensure the products being used in the field are the specified and approved products.
- J. Keep containers of wet products closed when not in use. Cover and seal materials which can release odor or dust.
- K. Containers of fuel, volatile liquids, and materials with high VOC content shall be tightly sealed and stored outside of the building.
- L. Protect absorbent materials from moisture during delivery to and storage at the job site. Store materials in a dry and clean environment.

### 3.3 PATHWAY INTERRUPTION (SMACNA Approach number 3)

- A. Use dust curtains or temporary enclosures to prevent dust from migrating to other areas when applicable. During construction, isolate areas of work to prevent contamination of clean or occupied areas.
- B. Keep pollutant sources as far away as possible from absorptive materials, ductwork, and areas occupied by workers.
- C. Isolate work areas and or create pressure differentials to prevent the migration of contaminants.
- D. Use portable fan systems to exhaust contaminated air directly to the outside of the building, and discharge the air to prevent recirculation.

### 3.4 HOUSE KEEPING (SMACNA Approach number 4)

- A. Keep HVAV components, not limited to coils, air filters, dampers, fans, and ductwork, clean during installation, and clean them as required prior to performing the testing, adjusting and balancing of the systems.
- B. Construction shall minimize the production and accumulation of dust and other contaminants. Use integral dust collection systems on drywall sanders, cut saws, and routers. Confine dust-generation activities to areas where cleaning can be carried out easily and where contaminants will not be tracked or contaminate other areas.
- C. Wetting agents or sweeping compounds shall be used to keep dust from becoming airborne.
- D. Wet cloths, damp mops, and vacuum cleaners with high efficiency particulate (HEPA) filters shall be used to clean. Cleaning frequency shall be increased when dust accumulation is noted.
- E. All spills and excess applications of solvent-containing products shall be cleaned using approved methods immediately. Water spills shall be cleaned-up promptly.



- F. Avoid accumulation of water inside the building and promptly remove any water that may occur. Protect porous materials such as insulation, ceiling tiles and drywall from water or moisture.
- G. Construction areas shall be kept dry. Promptly repair any leaks or penetrations that allow water to enter the building. Use dehumidification as necessary for prompt drying of wet surfaces and materials.
- H. Clean rough track off grates or matting at the entryway as necessary, at a minimum weekly to reduce dirt and particulates from entering the building, when building is enclosed.
- I. 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. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable use products that comply with the California Code of Regulations maximum allowable VOC levels.

### 3.5 SQUENCING AND SCHEDULING (SMACNA Approach number 5)

- A. Schedule the installation of porous materials after enclosure of the building. Porous materials shall not be installed until the building envelope is fully weather tight.
- B. Install porous or absorbent materials such as ceiling tiles, after odorous activities including drywall installation, painting, and floor finishing is completed.
- C. Do not allow contaminants from an area under construction to enter the HVAC systems or to migrate to completed areas of construction.
- D. Install new MERV 8 filters prior to the FF&E move-in and occupancy.
- E. Install furnishing after interior finishes have applied and fully cured.
- F. Provide adequate ventilation during curing period. To aid in curing of interior finishes and other products used during construction and to remove pollutants after drywall installation is complete provide adequate ventilation with 100% outside air, and proper filtration for any HVAC components activated. During humid periods or when high moisture materials are present, supplementary dehumidification may be required.
- G. All sanding of the concrete floors, floor preparation, and the poured-in-place terrazzo will be scheduled before the HVAC system startup.
- H. All drywall sanding and painting will be scheduled before the HVAC system startup.
- I. Move-in of all FF&E will occur after all construction activities have been substantially completed and the HVAC has been tested and balanced.

### 3.6 MONITORING AND IMPLEMENTATION OF IAQ PLAN

- A. Contractor to designate an on-site responsible staff member for instructing personnel and overseeing the Construction IAQ Management Plan.

- B. Implementation and distribution of the Construction IAQ Management Plan as approved by Commissioning Agent.
- C. Provide weekly Contractor site co-ordination meetings with subcontractors. Review appropriate components of the IAQ Construction Management Plan as a regular action item. Document the implementation of the Plan in the meeting minutes, and update the IAQ Construction Management Plan as required.
- D. Subcontractors and their employees shall be provided instruction and Training in the Indoor Air Quality (IAQ) Management Plan.
- E. Recording format: Use SMACNA IAQ Guidelines Appendix C (Planning Checklist) and Appendix D (Inspection Checklist) as a guide.
- F. Project-specific posters and signage will be posted in the jobsite office trailer, at all building entrances, and at several locations inside the building.

END OF SECTION 01 73 20

## SECTION 01 74 13 – GENERAL CLEANING

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Progress cleaning.
    - b. Final cleaning.

#### 1.3 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

### PART 2 – PRODUCTS

#### 2.1 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

### PART 3 – EXECUTION

#### 3.1 GENERAL

- A. Execute daily cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations.

- B. Provide on-site containers for the collection of waste materials, debris, and rubbish. Construction Manager must utilize services of local waste collection agencies or companies.
- C. Remove waste materials, debris and rubbish from the site periodically, and dispose of at legal disposal areas away from the site. Pay all fees for disposal.

### 3.2 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.
  - 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.
- 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 specification 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.

### 3.3 DUST CONTROL

- A. Perform work operations and cleaning in a manner to prevent excessive dust generation.
- B. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.
- C. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

### 3.4 FINAL CLEANING

- A. 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. 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. Polish glossy surfaces to a clear shine.
    - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - g. Sweep concrete floors broom clean in unoccupied spaces.
    - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    - j. Remove labels that are not permanent.
    - k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    - l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    - n. Clean ducts, blowers, and coils if units display contamination with particulate matter on inspection. Units shall not be operated without filters during construction.
      - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
      - 2) Clean permanent filters and replace disposable filters if units were operated during construction.
      - 3) Clean surfaces and blades of grilles, diffusers, registers, lenses, louvers, etc.
    - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.

- p. Enclosed spaces, such as above ceilings and voids in wall assemblies, are to be free from debris.
  - q. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds. Clean roof area and adjacent surfaces of any dirt or debris from construction activities.
  - r. Parking areas are to be cleaned of any grease or oil stains.
  - s. Leave Project clean and ready for occupancy.
- B. Prior to final completion, or Owner occupancy, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire work is clean. Inspect areas adjacent to the work area for any windblown debris and clean as necessary.

END OF SECTION 01 74 13

## SECTION 01 74 19 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  - 1. Salvaging nonhazardous demolition and construction waste.
  - 2. Recycling nonhazardous demolition and construction waste.
  - 3. Disposing of nonhazardous demolition and construction waste.
  - 4. Disposing of nonhazardous construction waste.

#### 1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.
- G. LEED: Leadership in Energy and Environmental Design Rating System as established by U.S. Green Building Council.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 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.

#### 1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 20 days of date established for Notice to Proceed.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Form CWM-7 for construction waste and Form CWM-8 for demolition waste. Include the following information:
  - 1. Material category.
  - 2. Generation point of waste.
  - 3. Total quantity of waste in tons.
  - 4. Quantity of waste salvaged, both estimated and actual in tons.
  - 5. Quantity of waste recycled, both estimated and actual in tons.
  - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
  - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. 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.
- E. Landfill Disposal Records: Indicate receipt and acceptance of waste by landfills licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- G. Green Globe Submittal: Green Globe letter template, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met. Refer to Schedule at the end of this section.

#### 1.7 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: The Waste Management coordination shall be a full-time member of the Contractor's on-site field team. The Waste Management Coordinator may have other on-site project responsibilities.



- 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 specification 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 demolition, site-clearing, and construction waste generated by the Work for construction waste and for demolition 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 for construction waste and for demolition 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. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  - 3. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  - 4. 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. 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 recycled materials.

5. Savings in hauling and tipping fees by donating materials.
6. Savings in hauling and tipping fees that are avoided.
7. Handling and transportation costs. Include cost of collection containers for each type of waste.
8. Net additional cost or net savings from waste management plan

## PART 2 - PRODUCTS (Not Applicable)

## 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 specification 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. Coordinator shall be present at Project site full time for duration of Project.
- 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 three 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 specification section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

### 3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
  1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  3. Store items in a secure area until installation.
  4. Protect items from damage during transport and storage.

5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale Not permitted on Project site.

C. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

### 3.3 RECYCLING DEMOLITION AND 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 [accrue to Owner] [accrue to Contractor] [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.

### 3.4 RECYCLING DEMOLITION WASTE

A. Asphalt Paving: Grind asphalt to maximum 1-1/2-inch size.

1. Crush asphaltic concrete paving and screen to comply with requirements in specification section "Earth Moving" for use as general fill.

- B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
  - 1. Pulverize concrete to maximum 1-1/2-inch size.
  - 2. Crush concrete and screen to comply with requirements in specification section "Earth
- D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
  - 1. Pulverize masonry to maximum 1-inch size.
    - a. Crush masonry and screen to comply with requirements in specification section "Earth Moving" for use as general fill.
    - b. Crush masonry and screen to comply with requirements in specification section "Plants" for use as mineral mulch.
  - 2. Clean and stack undamaged, whole masonry units on wood pallets.
- E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- F. Metals: Separate metals by type.
  - 1. Structural Steel: Stack members according to size, type of member, and length.
  - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- J. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- K. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
  - 1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- L. Carpet Tile: Remove debris, trash, and adhesive.
  - 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- N. Conduit: Reduce conduit to straight lengths and store by type and size.

### 3.5 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 specification 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 specification section "Plants" for use of clean ground gypsum board as inorganic soil amendment.

### 3.6 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: Do not burn waste materials.

#### C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

#### D. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 01 74 19



## SECTION 01 75 00 – STARTING AND ADJUSTING SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section as though bound herein.

#### 1.2 SECTION INCLUDES

- A. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - 1. Starting systems.
  - 2. Demonstration and instructions.
  - 3. Testing, adjusting, and balancing.

#### 1.3 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and Owner seven days prior to startup of each item.
- C. Verify each piece of equipment or system for proper lubrication, drive rotation, belt tension, control sequence, or other conditions that may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of responsible Contractors' personnel in accordance with manufacturers' instructions.
- G. When specified in individual specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to startup, and to supervise placing equipment or system in operation.
- H. Submit a written report, verifying the proper installation of the equipment or system and that it functions correctly.

#### 1.4 TESTING, ADJUSTING, AND BALANCING

- A. The Contractor will employ and pay for services of an independent firm to perform testing, adjusting and balancing.

- B. The independent firm shall perform the services as specified.
- C. The independent firm shall submit reports to the Architect indicating observations, results of tests and compliance or non-compliance with specified requirements and with the requirements of the contract documents.
- D. The independent firm shall coordinate scheduling of Testing, Adjusting, and Balancing activities with the Contractor.
  - 1. Testing, Adjusting and Balancing must be completed prior to scheduling equipment and system Functional Performance Testing.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

- 3.1 Contractor shall coordinate equipment and system start-up with the Architect.

END OF SECTION 01 75 00



## SECTION 01 77 00 – 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. Operation and Maintenance Manuals and Warranties.
  - 4. Final Cleaning.
  - 5. Repair of the Work.

#### 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 MAINTENANCE MATERIAL SUBMITTALS

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

#### 1.5 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 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. 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's signature for receipt of submittals.
  5. Submit test/adjust/balance records.
  6. Submit sustainable design submittals not previously submitted.
  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 ten (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.
  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 will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect 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, 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.
- E. When Architect concurs that the work is substantially complete, he will:

1. Prepare a Certificate of Substantial Completion on AIA Form G704, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect.
2. Submit the Certificate to Owner and Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

#### 1.6 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 specification section "Payment Procedures."
  2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. 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.
  4. Submit pest-control final inspection report.
- 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 will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

#### 1.7 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, by floor and room numbers.
  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.
    - d. Name of Contractor.
    - e. Page number.
  4. Submit list of incomplete items in the following format:
    - a. PDF electronic file. Architect will return annotated file.
    - b. Excel spread sheet.

1.8 SUBMITTAL OF PROJECT OPERATION AND MAINTENANCE MANUALS AND WARRANTIES

- A. Time of Submittal: Submit written Operation and Maintenance Manuals and Warranties fifteen (15) days prior to Substantial Completion.

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. Final Cleaning: Comply with final cleaning requirements in specification section "General Cleaning."
- B. Pest Control: Comply with pest control requirements in specification section "Temporary Facilities and Controls." Prepare written report.
- C. Construction Waste Disposal: Comply with waste disposal requirements in "Construction Waste Management and Disposal" specification section.

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 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.

- a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00



## SECTION 01 78 23 – OPERATION AND MAINTENANCE DATA

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation manuals for systems, subsystems, and equipment.
  - 2. Product maintenance manuals.
  - 3. Systems and equipment maintenance manuals.

#### 1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this section.
  - 1. Submit two (2) copies of preliminary draft of proposed formats and outlines of contents for manuals at least 30 days before commencing demonstration and training.
  - 2. Architect will comment on whether content of operations and maintenance submittals are acceptable.
  - 3. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least fifteen (15) working days before commencing demonstration and training. Architect will return copy with comments.
  - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within fifteen (15) working days of receipt of Architect's comments and prior to commencing demonstration and training.

## PART 2 - PRODUCTS

### 2.1 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  2. Performance and design criteria if Contractor has delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
- B. Descriptions: Include the following:
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.

### 2.2 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
  2. Manufacturer's name.
  3. Color, pattern, and texture.
  4. Material and chemical composition.
  5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
  2. Types of cleaning agents to be used and methods of cleaning.



3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

### 2.3 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
  - 1. Include procedures to follow and required notifications for warranty claims.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
  - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- C. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original project record documents as part of operation and maintenance manuals.
  - 2. Comply with requirements of newly prepared record Drawings in specification section "Project Record Documents."
- D. Comply with specification section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

## SECTION 01 78 30 – WARRANTIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Compile specified warranties and bonds.
- B. Compile specified service and maintenance contracts.
- C. Review submittals to verify compliance with Contract Documents.
- D. Submit to Architect for review and transmittal to Owner.

#### 1.3 GENERAL WARRANTY

- A. The Contractor shall warrant the project against defects in materials or workmanship and agrees to repair or replace components that fail and repair or replace defective workmanship within a specified warranty period of one (1) year after substantial completion unless indicated differently in a specific specification section.

#### 1.4 SUBMITTAL REQUIREMENTS

- A. Assemble warranties, bonds and service and maintenance contracts, executed by each of respective manufacturers, suppliers and subcontractors in accordance with Division 1 requirements.
- B. Number of original signed copies required: Three (3) each.
- C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item:
  - 1. Product or work item.
  - 2. Firm, with name of principal, address and telephone number.
  - 3. Scope.
  - 4. Date of beginning of warranty, bond or service and maintenance contract. In no case shall the date begin prior to acceptance by Architect of that portion of the work.
  - 5. Duration of warranty, bond or service maintenance contract.
  - 6. Provide information for Owner's personnel:
    - a. Proper procedure in case of failure.
    - b. Instances which might affect the validity of warranty or bond.
    - c. Construction Manager, name of responsible principal, address and telephone number.
    - d. Manufacturer: Contact person and telephone number.

1.5 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
  - 1. Size: 8-1/2" x 11" punch sheets for standard 3-ring binder:
    - a. Fold larger sheets to fit into binders.
  - 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS." List:
    - a. Title of Project.
    - b. Location of Project.
    - c. Name of Construction Manager.
- C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers, all of same color.

1.6 TIME OF SUBMITTALS

- A. For equipment or component parts of equipment put into service during progress of construction:
  - 1. Warranties shall start at the Date of Substantial Completion for each phase of work complete for the items related to that particular phase. The final warranties for the project will list the individual dates for the start date of each warranty per phase.
- B. Submit documents as indicated with Closeout Documents.
- C. For items of work where acceptance is delayed materially beyond Date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as start of warranty period.

1.7 SUBMITTALS REQUIRED

- A. Submit warranties, bonds, service and maintenance contracts as specified in respective Sections of Specifications.
- B. Submit additional manufacturer's standard warranties where available at no additional cost, but not specifically indicated in respective Specification Sections.

END OF SECTION 01 78 30

## SECTION 01 78 39 – 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.

#### 1.3 ACTION SUBMITTAL

- A. At Substantial Completion, deliver Record Documents to Architect for review prior to sending to the Owner.
- B. Accompany submittal with transmittal letter in duplicate, containing:
  - 1. Date.
  - 2. Project title and number.
  - 3. Contractor's name and address.
  - 4. Title and number of each Record Document.
  - 5. Signature of Construction Manager or his authorized representative.
- C. Should Architect/Engineer determine the Record Documents are not complete, Construction Manager shall rework Documents to properly record all contractual items. Record Documents shall then be resubmitted for additional review. The Construction Manager is solely responsible for recording all data on the Project Record Documents.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Digital Copies: Submit copies of record Drawings as follows:
    - a. Initial Submittal: Submit record digital data files and one set(s) of plots.
    - b. Final Submittal: Submit record digital data files and three set(s) of record digital data file plots.
  - 2. Number of Paper Copies: Submit copies of record Drawings as follows:
    - a. Initial Submittal: Submit one set(s) of prints.

- b. Final Submittal: Submit three set(s) of prints.
  - c. Final Submittals: Submit PDF.
- B. Record Specifications: Submit of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit 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 of each submittal.

## 1.5 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and samples in Construction Manager's field office apart from documents used for construction.
- 1. Provide files and racks for storage of documents.
- B. File documents and samples in accordance with CSI/CSC format.
- C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- D. Make documents and samples available at all times for inspection by Architect. Review and verify monthly, prior to submittal of Construction Manager's Application for Payment.
- 1. Owner and Architect shall review record documents prior to approval of monthly Application for Payment.
- E. Update documents to record changes as the work progresses. Completed portions of work should be recorded in a clear, legible and finished manner.
- F. As a minimum, update documents prior to each Application for Payment. Architect shall review documents prior to approval of Application for Payment. Failure of the Construction Manager to maintain record documents as stated shall result in the non-approval of the Application for Payment, or at minimum, a reduction to the payment due.

## 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's written orders.
    - l. Details not on the original Contract Drawings.
  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.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
  2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
  3. Refer instances of uncertainty to Architect for resolution.
  4. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
    - a. See Specification Section "Submittal Procedures" for requirements related to use of Architect's digital data files.
    - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
3. Identification: As follows:
  - a. Project name.
  - b. Date.
  - c. Designation "PROJECT RECORD DRAWINGS."
  - d. Name of Architect.
  - e. Name of Contractor.

## 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. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
  3. Note related Change Orders and record Drawings where applicable.
- B. Format: Submit record Specifications as an annotated PDF electronic file.

## 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 an annotated PDF electronic file.
  1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

## 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.



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- 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's and Contractor reference during normal working hours.

END OF SECTION 01 78 39



## SECTION 01 79 00 – DEMONSTRATION AND TRAINING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training presentation.

#### 1.4 QUALITY ASSURANCE

- A. Instructor Qualifications: A factory-authorized service representative, experienced in operation and maintenance procedures and training.
- B. Pre-Instruction Conference: Conduct conference at Project site to comply with review methods and procedures related to demonstration and training including, but not limited to, the following:
  - 1. Inspect and discuss locations and other facilities required for instruction.
  - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
  - 3. Review required content of instruction.

#### 1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

- C. Coordinate content of training presentation with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

## PART 2 - PRODUCTS

### 2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes a training presentation for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Presentation: Develop a learning objective and teaching outline for each presentation. Include a description of specific skills and knowledge that participant is expected to master. For each presentation, include instruction for the following as applicable to the system, equipment, or component:
  - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Operating standards.
    - c. Regulatory requirements.
    - d. Equipment function.
    - e. Operating characteristics.
    - f. Limiting conditions.
  - 2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Identification systems.
    - e. Maintenance service agreements and similar continuing commitments.
  - 3. Emergencies: Include the following, as applicable:
    - a. Instructions on meaning of warnings, trouble indications, and error messages.
    - b. Shutdown instructions for each type of emergency.
    - c. Operating instructions for conditions outside of normal operating limits.
  - 4. Operations: Include the following, as applicable:
    - a. Startup procedures.
    - b. Equipment or system break-in procedures.
    - c. Routine and normal operating instructions.
    - d. Regulation and control procedures.
    - e. Control sequences.
    - f. Safety procedures.
    - g. Normal shutdown instructions.
    - h. Operating procedures for system, subsystem, or equipment failure.
    - i. Seasonal and weekend operating instructions.
    - j. Required sequences for electric or electronic systems.
  - 5. Adjustments: Include the following:
    - a. Alignments.
    - b. Checking adjustments.
    - c. Noise and vibration adjustments.
    - d. Economy and efficiency adjustments.
  - 6. Troubleshooting: Include the following:
    - a. Diagnostic instructions.
    - b. Test and inspection procedures.

7. Maintenance: Include the following:
  - a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning
  - e. Procedures for routine and preventative maintenance.
  - f. Instruction on use of special tools.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training material and assemble into a training manual.
- B. Set up instructional equipment at instruction location.
- C. Provide a list of attendees.

#### 3.2 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  1. Owner will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed on times. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- D. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

#### 3.3 DEMONSTRATION AND TRAINING VIDEOTAPES

- A. General: Engage a qualified commercial photographer to record demonstration and training videotapes. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
- B. Videotape Format: Provide HD digital full color DVD and USB flash drive.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.

END OF SECTION 01 79 00



## SECTION 01 81 13 – SUSTAINABLE DESIGN REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 0 and other Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes general requirements and procedures for compliance with certain Green Globes' Green Building Initiative requirements needed for the Project.
  - 1. The intent is to follow Green Globe Green Building Initiative requirements to obtain a compliant level of at least 350 points (One Globe), but actual certification will not be required. However online questionnaires shall be completed to substantiate compliance with the indicated requirements.
  - 2. Other Green Building Initiative requirements needed to obtain minimum Green Building Initiative goals are dependent on material selections and may not be specifically identified as Green Building Initiative requirements. Compliance with requirements needed to obtain Green Building Initiative goals may be used as one criterion to evaluate substitution requests.
  - 3. Additional Green Building Initiative requirements needed to obtain the indicated Green Building Initiative goal are dependent on the Architect's and Building Engineer's design and other aspects of the Project related to Commissioning and Construction.
- B. Related Sections include the following:
  - 1. Other specification Divisions and Sections for Green Building Initiative requirements specific to the Work of each of those Sections. These requirements may or may not include reference to Green Building Initiative.

#### 1.3 DEFINITIONS

- A. Regionally Manufactured Materials: Materials that are manufactured within a radius of 500 miles (800 km) from the Project location. Manufacturing refers to the final assembly of components into the building product that is installed at the Project site.
- B. Regionally Extracted, Harvested, or Recovered Materials: Materials that are extracted, harvested, or recovered and manufactured within a radius of 500 miles (800 km) from the Project site.
- C. Recycled Content: The percentage by weight of constituents that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer).
  - 1. Spills and scraps from the original manufacturing process that are combined with other constituents after a minimal amount of reprocessing for use in further production of the same product are not recycled materials.

2. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.

#### 1.4 ACTION SUBMITTALS

- A. General: Submit additional Green Building Initiative submittal requirements included in other sections of the Specifications.
- B. Green Building Initiative submittals are conjunctive to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated Green Building Initiative requirements.
- C. Project Materials Cost Data: Provide statement indicating total cost for building materials used for Project. Include statement indicating total cost of mechanical and electrical components.
- D. Green Building Initiative Action Plan: Provide preliminary submittals within 14 days of date established for the Notice to Proceed indicating how the following requirements will be met.
  1. Construction Activity Pollution Prevention complying also with Division 1 Sections.
  2. Measurement and Verification of Mechanical Systems and their performance.
  3. Waste management plan complying with specification section "Construction Waste Management."
  4. A list of proposed materials with recycled content.
    - a. Indicate cost, post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.
  5. A list of proposed regionally manufactured materials and or regionally extracted, harvested, or recovered materials.
    - a. Identify each regionally manufactured material, its source, and cost.
    - b. Identify each regionally extracted, harvested or recovered material, its source, and cost.
  6. Construction indoor air quality management plan during construction and before occupancy.
- E. Green Building Initiative Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with Green Building Initiative action plans for the following:
  1. Waste reduction progress reports complying with specification section "Construction Waste Management."
  2. Recycled content.
  3. Regionally manufactured materials and or regionally extracted, harvested, or recovered materials.
- F. Green Building Initiative Documentation Submittals:
  1. Product Data for new HVAC equipment indicating Minimum Energy Performance and absence of CFC refrigerants.
  2. Product Data for new HVAC equipment indicating absence of HCFC refrigerants, and for clean- agent fire-extinguishing systems indicating absence of HCFC and Halon.
  3. Product Data and wiring diagrams for sensors and data collection system used to provide continuous metering of building energy and water consumption performance over time.
  4. Compliance with specification section "Construction Waste Management."



5. Product Data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.
6. Product Data indicating location of material manufacturer for regionally manufactured materials.
  - a. Include statement indicating cost and distance from manufacturer to Project for each regionally manufactured material.
  - b. Include statement indicating cost and distance from point of extraction, harvest, or recovery to Project for each raw material used in regionally manufactured materials.
7. Product Data and Shop Drawings for carbon dioxide monitoring system.
8. Indoor Air Quality Management Plan During Construction:
  - a. Construction indoor air quality management plan.
  - b. Product Data for temporary filtration media.
  - c. Product Data for filtration media used during occupancy.
  - d. Construction Documentation: Six photographs at three different occasions during construction along with a brief description of the SMACNA approach employed, documenting implementation of the IAQ (indoor air quality) management measures, such as protection of ducts and on-site stored or installed absorptive materials.
9. Product Data for adhesives and sealants used on the interior of the building indicating VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subpart D (EPA method 24).
10. Product Data for paints and coatings used on the interior of the building indicating chemical composition and VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subpart D (EPA method 24).
11. Product Data for carpet products indicating VOC content of each product used.
12. Product Data for composite wood and agrifiber products indicating that products contain no urea- formaldehyde resin.
  - a. Include statement indicating adhesives and binders used for each product.

## PART 2 - PRODUCTS

### 2.1 RECYCLED CONTENT OF MATERIALS

- A. Provide building materials with recycled content such that post-consumer recycled content constitutes a minimum of five percent of the cost of materials used for the Project or such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of 10 percent of the cost of materials used for the Project.
- B. Provide building materials with recycled content such that post-consumer recycled content constitutes a minimum of 10 percent of the cost of materials used for the Project.
  1. The cost of post-consumer recycled content of an item shall be determined by dividing the weight of post-consumer recycled content in the item by the total weight of the item and multiplying by the cost of the item.
  2. The cost of postconsumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing the weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by the total weight of the item and multiplying by the cost of the item.
  3. Do not include mechanical and electrical components in the calculation.
  4. Recycled content of materials shall be defined according to the Federal Trade Commission's "Guide for the Use of Environmental Marketing Claims," 16 CFR 260.7 (e).

## 2.2 REGIONAL MATERIALS

- A. Provide 10 percent of building materials (by cost) that are regionally manufactured materials.
- B. Of the regionally manufactured materials from above, provide at least 50 percent (by cost) that are regionally extracted, harvested, or recovered materials.

## 2.3 LOW-EMITTING MATERIALS

- A. For interior applications use adhesives and sealants that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24):
  - 1. Wood Glues: 30 g/L.
  - 2. Metal to Metal Adhesives: 30 g/L.
  - 3. Adhesives for Porous Materials (Except Wood): 50 g/L.
  - 4. Plastic Foam Adhesives: 50 g/L.
  - 5. Carpet Adhesives: 50 g/L.
  - 6. Cove Base Adhesives: 50 g/L.
  - 7. Gypsum Board and Panel Adhesives: 50 g/L.
  - 8. Rubber Floor Adhesives: 60 g/L.
  - 9. Ceramic Tile Adhesives: 65 g/L.
  - 10. Multipurpose Construction Adhesives: 70 g/L.
  - 11. Fiberglass Adhesives: 80 g/L.
  - 12. Contact Adhesive: 250 g/L.
  - 13. CPVC Welding Compounds: 490 g/L.
  - 14. PVC Welding Compounds: 510 g/L.
  - 15. Adhesive Primer for Plastic: 650 g/L.
  - 16. Sealants: 250 g/L.
- B. For interior applications use paints and coatings that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA method 24) and the following chemical restrictions:
  - 1. Flat Paints and Coatings: VOC not more than 50 g/L.
  - 2. Non-Flat Paints and Coatings: VOC not more than 150 g/L.
  - 3. Anti-Corrosive Coatings: VOC not more than 250 g/L.
  - 4. Varnishes and Sanding Sealers: VOC not more than 350 g/L.
  - 5. Stains: VOC not more than 250 g/L.
  - 6. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
  - 7. Restricted Components: Paints and coatings shall not contain any of the following:
    - a. Acrolein.
    - b. Acrylonitrile.
    - c. Antimony.
    - d. Benzene.
    - e. Butyl benzyl phthalate.
    - f. Cadmium.
    - g. Di (2-ethylhexyl) phthalate.
    - h. Di-n-butyl phthalate.
    - i. Di-n-octyl phthalate.
    - j. 1,2-dichlorobenzene.
    - k. Diethyl phthalate.

- l. Dimethyl phthalate.
- m. Ethylbenzene.
- n. Formaldehyde.
- o. Hexavalent chromium.
- p. Isophorone.
- q. Lead.
- r. Mercury.
- s. Methyl ethyl ketone.
- t. Methyl isobutyl ketone.
- u. Methylene chloride.
- v. Naphthalene.
- w. Toluene (methylbenzene).
- x. 1,1,1-trichloroethane.
- y. Vinyl chloride.

- C. Do not use composite wood and agrifiber products that contain urea-formaldehyde resin.

### PART 3 - EXECUTION

#### 3.1 REFRIGERANT AND CLEAN-AGENT FIRE-EXTINGUISHING-AGENT REMOVAL

- A. Remove HCFC-based refrigerants from existing HVAC and refrigeration equipment. Provide equipment to accommodate new refrigerant.
  - 1. Refer to Division 23 Sections for additional requirements.

#### 3.2 CONSTRUCTION WASTE MANAGEMENT

- A. Comply with specification section "Construction Waste Management."

#### 3.3 CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT

- A. Comply with SMACNA IAQ Guideline for Occupied Buildings under Construction.
  - 1. If Owner authorizes the use of permanent heating, cooling, and ventilating systems during construction period as specified in specification section "Temporary Facilities and Controls" install filter media having a MERV 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction.
  - 2. Replace all air filters immediately prior to occupancy.
- B. Indoor Air Quality Management Plan Prior to Occupancy:
  - 1. Comply with SMACNA IAQ Guideline for Occupied Buildings under Construction.
    - a. If the Owner authorizes the use of permanent heating, cooling, and ventilating systems during construction period as specified in specification section "Temporary Facilities and Controls", install filter media having a MERV 8 according to ASHRAE 52.2 at each return air inlet for the air-handling system used during construction.

END OF SECTION 01 81 13



## SECTION 02 41 19 – SELECTIVE DEMOLITION

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Demolition and removal of selected portions of building or structure.
    - b. Demolition and removal of selected site elements.
    - c. Salvage of existing items to be reused or recycled.

#### 1.3 REFERENCES

- A. Comply with NFPA 1 – Chapter 29 and NFPA 241 Standard for Safeguarding Construction Alteration and Demolition Operation Latest Adopted Edition.
- B. FBC – Florida Building Code.

#### 1.4 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage and turn over to Owner or for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged.

1.5 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Carefully salvage indicated items in a manner to prevent damage and promptly return to Owner or reuse where indicated.

1.6 PRE-DEMOLITION MEETINGS

- A. The Contractor shall conduct a pre-demolition meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
  - 1. Inspect and discuss condition of construction to be selectively demolished.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
  - 5. Review areas where existing construction is to remain and requires protection.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- C. Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's on-site operations are uninterrupted.
  - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Predemolition Video: Show existing conditions of adjoining construction, including finish surfaces that might be misconstrued as damage caused by demolition operations.

1.8 PRE-DEMOLITION MEETING

- A. Pre-demolition Conference: Conduct conference at Project site.
  - 1. Inspect and discuss condition of construction to be demolished.
  - 2. Review structural load limitations of existing structures.

3. Review and finalize selective demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review and finalize protection requirements.
5. Review procedures for noise control and dust control.
6. Review procedures for protection of adjacent buildings.
7. Review items to be salvaged and returned to Owner or reused.

#### 1.9 QUALITY ASSURANCE

- A. Demolition Firm: Company specializing in performing the Work of this Section with minimum five years documented experience.

#### 1.10 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and drawings before proceeding with selective demolition.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- F. Maintain fire-protection facilities in service during selective demolition operations.
- G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

#### 1.11 HAZARDOUS MATERIALS

- A. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.
  1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

#### 1.12 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations of capped utilities, subsurface obstructions, and structures.

#### 1.13 SALVAGE

- A. The Owner has the first right to salvage reusable equipment.

- B. The Contractor shall salvage indicating items for reuse in the project.
- C. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations. Comply with specification section "Photographic Documentation."
- D. Salvage: Items indicated to be removed for salvaged:
  - 1. Bricks.
  - 2. Clean salvaged items of dirt and demolition debris.
  - 3. Store items in a secure area until delivery to Owner or reused.
  - 4. Protect items from damage during transport and storage.
- E. See drawings for items are to be salvage for reuse in the project:

#### 1.14 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.
- C. Conform to applicable codes for demolition of structures, safety of adjacent structures, dust control, runoff, and erosion control, and disposal of demolished materials.
- D. Obtain required permits from authorities having jurisdiction.
- E. Notify affected utility companies before starting work and comply with their requirements.
- F. Do not close or obstruct roadways, sidewalks, and hydrants, without permits.
- G. Conform to applicable regulatory procedures when discovering hazardous or contaminated materials and contact the Architect and Owner immediately if discovered.
- H. Test soils around buried tanks for contamination.

#### PART 2 - PRODUCTS (Not Applicable)

#### PART 3 - EXECUTION

##### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.



- C. Salvaged Items: Provide photographs or video of equipment to be salvaged prior to commencing work and conditions that might be misconstrued as damage caused by salvage operations.

### 3.2 GENERAL

- A. 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 existing 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. Cutting: Cut existing 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 as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  - 3. For 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 2 Sections where required by cutting and patching operations.
  - 5. Proceed with patching after construction operations requiring cutting are complete.
- C. 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 possible. Provide materials and comply with installation requirements specified in other sections of these specifications.
  - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate 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 eliminate evidence of patching and refinishing.
  - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  - 4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
  - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather tight condition.

### 3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished. Refer to engineering drawings for further information.
  - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  - 2. Contractor to arrange to shut off utilities with utility companies.
  - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  - 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
    - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
    - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

### 3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable,

protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  5. Maintain fire watch during and for at least 24 hours after flame-cutting operations.
  6. Maintain adequate ventilation when using cutting torches.
  7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  10. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
  2. Store items in a secure area until delivery to Owner or reuse.
  3. Transport items to Owners storage area designated by Owner.
  4. Protect items from damage during transport and storage.

### 3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
  - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
  - 2. Remove existing roofing system down to substrate.

### 3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
  - 4. Comply with requirements specified in specification section "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

### 3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

## SECTION 03 10 00 – CONCRETE FLOOR REMOVAL AND REPLACEMENT

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Concrete removal and replacement.
    - b. Reinforcement.
    - c. Accessories.

#### 1.3 REFERENCES

- A. ACI 117 – Standard Tolerances for Concrete Construction and Materials.
- B. ACI 301 – Specifications for Structural Concrete for Buildings.
- C. ACI 302.1R – Guide for Concrete Floor and Slab Construction.
- D. ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- E. ASTM A1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- F. ASTM C33 – Standard Specification for Concrete Aggregates.
- G. ASTM C150 – Standard Specification for Portland Cement.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For concrete specialist.
- B. Material Certificates: For each type of portland cement and aggregate supplied for mixing or adding to products at Project site.

## 1.6 QUALITY ASSURANCE

- A. Concrete-Maintenance Specialist Qualifications: Engage an experienced concrete firm that employs installers and supervisors who are trained to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing or patching new concrete is insufficient experience for concrete-maintenance work.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.
- B. Store cementitious materials off the ground, under cover, and in a dry location.
- C. Store aggregates covered and in a dry location; maintain grading and other required characteristics and prevent contamination.

## 1.8 FIELD CONDITIONS

- A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.
- B. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 deg F (32 deg C) and above.

## 1.9 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

## PART 2 - PRODUCTS

### 2.1 CONCRETE, GENERAL

- A. Comply with ACI 301, ACI 302, and ACI 117 (ACI 117M).

### 2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615, Grade 60.

- B. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.

## 2.3 CONCRETE MATERIALS

### A. Cementitious Materials:

- 1. Portland Cement: ASTM C 150/C 150M, or Type III.

- B. Normal-Weight Aggregate: ASTM C 33/C 33M, 1/2-inch nominal maximum aggregate size.

- C. Air-Entraining Admixture: ASTM C 260/C 260M.

- D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do 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.

- E. Water: ASTM C 94/C 94M.

## 2.4 FIBER REINFORCEMENT

- A. Synthetic Micro-Fiber: Monofilament or fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches long.

## 2.5 CURING MATERIALS

- A. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

## 2.6 BONDING AGENTS

- A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Manufactured product that consists of water-insensitive epoxy adhesive, portland cement, and water-based solution of corrosion-inhibiting chemicals that forms a protective film on steel reinforcement.

## 2.7 SHEET MATERIALS

- A. Below Grade Sheet Retarder shall have the following properties:

- 1. Basis of Design: "Stego Vapor Barrier" as manufactured by Stego Co.

2. Permeance Rating: Per ASTM E96 or ASTM F1249. Material shall meet permeance requirement for both new material and after ASTM E1745.
3. Water Vapor Retarder: Meet or exceed Class A per ASTM E1795.
4. Polyethylene film, 15-mil thick, and perm rating of .01 perms (gr/ft<sup>2</sup>/hr/in-HG).

B. Polyurethane Sealant: ASTM C920, single component, chemical curing, non-sagging, and black color

1. Elongation Capability: 25%
2. Shore A Hardness Range: 20 to 35

C. Tape shall be as required by the manufacturer of the vapor retarder with a maximum water vapor transmission rate of .03 perms (ASTM E 96).

## 2.8 CONCRETE MIXTURES

A. Comply with ACI 301 (ACI 301M).

B. Normal-Weight Concrete:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
3. Slump: 4 inches to 5 inches with verified slump of 2 to 4 inches before adding high.
4. Air Content: Maintain within range permitted by ACI 301 (ACI 301M). Do not allow air content of trowel-finished floor slabs to exceed 3 percent.

## 2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116 and furnish batch ticket information.

1. When air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Have concrete-maintenance work performed only by qualified concrete-maintenance specialist.
- B. Comply with manufacturers' written instructions for surface preparation and product application.

### 3.2 PREPARATION

- A. Ensure that supervisory personnel are on-site and on duty when work begins and during its progress.



- B. Protect surrounding surfaces of building from harm resulting from work.
  - 1. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
  - 2. Use only proven protection methods appropriate to each area and surface being protected.
  - 3. Provide temporary barricades, barriers, and directional signage to exclude public from areas where concrete maintenance work is being performed.
  - 4. Contain dust and debris generated by concrete maintenance work and prevent it from reaching the public or adjacent surfaces.
  - 5. Protect adjacent surfaces and equipment by covering them with heavy polyethylene film and waterproof masking tape or a liquid strippable masking agent. If practical, remove items, store, and reinstall after potentially damaging operations are complete.
  - 6. Dispose of debris and runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
  
- C. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.
  - 1. Prevent solids such as aggregate or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from concrete maintenance work.
  - 2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.
  
- D. Preparation for Concrete Removal: Examine construction to be repaired to determine best methods to safely and effectively perform concrete maintenance work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed in the course of repair.
  - 1. Verify that affected utilities have been disconnected and capped.

### 3.3 CONCRETE REMOVAL

- A. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch. Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement.
- B. Thoroughly clean removal areas of loose concrete, dust, and debris.

### 3.4 BONDING AGENT APPLICATION

- A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Apply to concrete by stiff brush or hopper spray according to manufacturer's written instructions. Apply to reinforcing bars in two coats, allowing first coat to dry two to three hours before applying second coat. Allow to dry before placing patching mortar or concrete.

### 3.5 VAPOR BARRIER INSTALLATION

- A. Install, protect, and repair vapor retarders according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.
- B. Remove loose or foreign matter that might impair adhesion.
- C. Clean and prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.
- D. Vapor barrier shall be installed in accordance with manufacturer's specifications, free of air pockets and wrinkles.
- E. All laps shall be continuously sealed with adhesive according to manufacturer's recommendations.
- F. Lap all joints a minimum of 6" and tape joints.
- G. Seal all penetrations (including pipes) per manufacturer's requirements with tape to restore barrier integrity.
- H. Secure to existing vapor barrier at least 6" where possible. If not possible provide 2" tape lap under existing vapor barrier and tie in new vapor barrier and provide additional tape to provide a tight seal.

### 3.6 REINFORCEMENT INSTALLATION

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Install #5 rebar dowels 12" long at 24" o.c. around perimeter of opening. Drill 6" deep hole in existing concrete and secure with non-shrink grout.
- C. Install welded wire fabric and lap adjoining pieces at least one full mesh and lace splices with 16-gauge wire.

### 3.7 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:
- C. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

### 3.8 CONCRETE PLACEMENT

- A. Comply with ACI 301 for placing concrete.
- B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
- C. Do not add water to concrete during delivery, at Project site, or during placement.
- D. Consolidate concrete with mechanical vibrating equipment according to ACI 301.

### 3.9 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.
  1. Do not further disturb surfaces before starting finishing operations.
- C. Finish: Match adjacent existing floor finishes unless otherwise indicated.

### 3.10 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 with ACI 301 (ACI 301M) for hot-weather protection during curing.
- B. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- C. 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.

END OF SECTION 03 10 00



## SECTION 03 10 10 – CAST-IN-PLACE CONCRETE PATCHING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Concrete patching.
    - b. Reinforcement.
    - c. Accessories.

#### 1.3 REFERENCES

- A. ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- B. ASTM A1064 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- C. ASTM C33 – Standard Specification for Concrete Aggregates.
- D. ASTM C150 – Standard Specification for Portland Cement.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For concrete specialist.
- B. Material Certificates: For each type of portland cement and aggregate supplied for mixing or adding to products at Project site.

#### 1.6 QUALITY ASSURANCE

- A. Concrete-Maintenance Specialist Qualifications: Engage an experienced concrete firm that employs installers and supervisors who are trained to perform work of this Section. Firm shall

have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience in only installing or patching new concrete is insufficient experience for concrete-maintenance work.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.
- B. Store cementitious materials off the ground, under cover, and in a dry location.
- C. Store aggregates covered and in a dry location; maintain grading and other required characteristics and prevent contamination.

#### 1.8 FIELD CONDITIONS

- A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.
- B. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 deg F (32 deg C) and above.

#### 1.9 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Source Limitations: For repair products, obtain each color, grade, finish, type, and variety of product from single source and from single manufacturer with resources to provide products of consistent quality in appearance and physical properties.

#### 2.2 BONDING AGENTS

- A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Manufactured product that consists of water-insensitive epoxy adhesive, portland cement, and water-based solution of corrosion-inhibiting chemicals that forms a protective film on steel reinforcement.

## 2.3 PATCHING MORTAR

### A. Patching Mortar Requirements:

1. Only use patching mortars that are recommended by manufacturer for each applicable horizontal, vertical, or overhead use orientation.
2. Color and Aggregate Texture: Provide patching mortar and aggregates of sizes necessary to produce patching mortar that matches existing, adjacent, exposed concrete. Blend several aggregates if necessary to achieve suitable matches.

### B. Polymer-Modified, Cementitious Patching Mortar: Packaged, dry mix for repair of concrete and that contains a latex additive as either a dry powder or a separate liquid that is added during mixing.

## 2.4 AGGREGATE

### A. Aggregate: Washed aggregate, ASTM C 33/C 33M.

## 2.5 REINFORCEMENT

### A. Reinforcing Bars (ReBar): ASTM A615, Grade 60 for bars No. 5.

### B. Welded Wire Fabric (WWF): ASTM A1064.

## 2.6 SHEET MATERIALS

### A. Below Grade Sheet Retarder (Building slabs on grade) shall have the following properties

1. Basis of Design: "Stego Vapor Barrier" as manufactured by Stego Co.
2. Permeance Rating: Per ASTM E96 or ASTM F1249. Material shall meet permeance requirement for both new material and after ASTM E1745.
3. Water Vapor Retarder: Meet or exceed Class A per ASTM E1795.
4. Polyethylene film, 15-mil thick, and perm rating of .01 perms (gr/ft<sup>2</sup>/hr/in-HG).

### B. Polyurethane Sealant: ASTM C920, single component, chemical curing, non-sagging, and black color

1. Elongation Capability: 25%
2. Shore A Hardness Range: 20 to 35

### C. Tape shall be as required by the manufacturer of the vapor retarder with a maximum water vapor transmission rate of .03 perms (ASTM E 96).

## 2.7 MISCELLANEOUS MATERIALS

### A. Portland Cement: ASTM C 150/C 150M, Type I, II, or III unless otherwise indicated.

### B. Water: Potable.

## 2.8 MIXES

- A. General: Mix products, in clean containers, according to manufacturer's written instructions.
  - 1. Do not add water, thinners, or additives unless recommended by manufacturer.
  - 2. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of measure.
  - 3. Do not mix more materials than can be used within time limits recommended by manufacturer. Discard materials that have begun to set.

## PART 3 - EXECUTION

### 3.1 CONCRETE REPLACEMENT

- A. Have concrete-maintenance work performed only by qualified concrete-maintenance specialist.
- B. Comply with manufacturers' written instructions for surface preparation and product application.

### 3.2 EXAMINATION

- A. Notify Architect seven days in advance of dates when areas of deteriorated or delaminated concrete and deteriorated reinforcing bars will be located.
- B. Locate areas of deteriorated or delaminated concrete using hammer or chain-drag sounding and mark boundaries. Mark areas for removal by simplifying and squaring off boundaries. At columns and walls make boundaries level and plumb unless otherwise indicated.
- C. Pachometer Testing: Locate at least three reinforcing bars using a pachometer, and drill test holes to determine depth of cover. Calibrate pachometer using depth of cover measurements and verify depth of cover in removal areas using pachometer.
- D. Perform surveys as the Work progresses to detect hazards resulting from concrete-maintenance work.

### 3.3 PREPARATION

- A. Ensure that supervisory personnel are on-site and on duty when concrete maintenance work begins and during its progress.
- B. Protect persons, motor vehicles, surrounding surfaces of building being repaired, building site, plants, and surrounding buildings from harm resulting from concrete maintenance work.
  - 1. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
  - 2. Use only proven protection methods appropriate to each area and surface being protected.



3. Provide temporary barricades, barriers, and directional signage to exclude public from areas where concrete maintenance work is being performed.
4. Contain dust and debris generated by concrete maintenance work and prevent it from reaching the public or adjacent surfaces.
5. Protect adjacent surfaces and equipment by covering them with heavy polyethylene film and waterproof masking tape or a liquid strippable masking agent. If practical, remove items, store, and reinstall after potentially damaging operations are complete.
6. Dispose of debris and runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

C. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.

1. Prevent solids such as aggregate or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from concrete maintenance work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

D. Preparation for Concrete Removal: Examine construction to be repaired to determine best methods to safely and effectively perform concrete maintenance work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed in the course of repair.

1. Verify that affected utilities have been disconnected and capped.

### 3.4 CONCRETE REMOVAL

- A. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch. Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement.
- B. Thoroughly clean removal areas of loose concrete, dust, and debris.

### 3.5 BONDING AGENT APPLICATION

- A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Apply to concrete by stiff brush or hopper spray according to manufacturer's written instructions. Apply to reinforcing bars in two coats, allowing first coat to dry two to three hours before applying second coat. Allow to dry before placing patching mortar or concrete.

### 3.6 PATCHING MORTAR APPLICATION

- A. Place patching mortar as specified in this article unless otherwise recommended in writing by manufacturer.
- B. Pretreatment: Apply specified bonding agent.

- C. General Placement: Place patching mortar by troweling toward edges of patch to force intimate contact with edge surfaces. For large patches, fill edges first and then work toward center, always troweling toward edges of patch. At fully exposed reinforcing bars, force patching mortar to fill space behind bars by compacting with trowel from sides of bars.
- D. Finishing: Allow surfaces of lifts that are to remain exposed to become firm and then finish to a smooth surface with a wood or sponge float.
- E. Curing: Wet-cure cementitious patching materials, including polymer-modified cementitious patching materials, for not less than seven days by water-fog spray or water-saturated absorptive cover.

### 3.7 VAPOR BARRIER INSTALLATION

- A. Remove loose or foreign matter that might impair adhesion.
- B. Clean and prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.
- C. Vapor barrier shall be installed in accordance with manufacturer's specifications, free of air pockets and wrinkles.
- D. All laps shall be continuously sealed with adhesive according to manufacturer's recommendations.
- E. Lap all joints a minimum of 6" and tape joints.
- F. Seal all penetrations (including pipes) per manufacturer's requirements with tape to restore barrier integrity.
- G. Secure to existing vapor barrier at least 6" where possible. If not possible provide 2" tape lap under existing vapor barrier and tie in new vapor barrier and provide additional tape to provide a tight seal.

### 3.8 REINFORCEMENT INSTALLATION

- A. Install #5 rebar dowels 18" long at 24" o.c. around perimeter of opening. Drill 6" deep hole in existing concrete and secure with non-shrink grout.
- B. Install welded wire fabric and lap adjoining pieces at least one full mesh and lace splices with 16-gauge wire.

### 3.9 CONCRETE PLACEMENT

- A. Place concrete as specified in this article.
- B. Pretreatment: Apply epoxy-modified, cementitious bonding and concrete substrate.
- C. Standard Placement:

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Library Renovation & Addition  
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1. Use vibrators to consolidate concrete as it is placed.
  2. At unformed surfaces, screed concrete to produce a surface that when finished with patching mortar will match required profile and surrounding concrete.
  3. introduced. When formed space is full, close air vents and pressurize to 14 psi (96 kPa).
- D. Wet-cure concrete for not less than seven days by leaving forms in place or keeping surfaces continuously wet by water-fog spray or water-saturated absorptive cover.

END OF SECTION 03 10 10



## 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.
- B. Related Requirements:

- 1. SELECTIVE DEMOLITION – DEBRIS.

#### 1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

#### 1.4 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.
  - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
    - a. Contractor's superintendent.
    - b. Independent testing agency responsible for concrete design mixtures.
    - c. Ready-mix concrete manufacturer.
    - d. Concrete Subcontractor.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design mixtures in "Design Mixtures" Paragraph below are usually considered to be an action submittal.
- C. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
  - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- D. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
  - 1. Location of construction joints is subject to approval of the Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 01 40 00 "Quality Requirements" and as supplemented in "Quality Assurance" Article.
- B. Qualification Data: For Installer, and manufacturer.
- C. Welding certificates.
- D. Material Certificates: For each of the following, signed by manufacturers:
  - 1. Cementitious materials.
  - 2. Admixtures.
  - 3. Form materials and form-release agents.
  - 4. Steel reinforcement and accessories.
  - 5. Waterstops.
  - 6. Curing compounds.
  - 7. Floor and slab treatments.
  - 8. Bonding agents.
  - 9. Adhesives.
  - 10. Vapor retarders.
  - 11. Semirigid joint filler.
  - 12. Joint-filler strips.
  - 13. Repair materials.
- E. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.
  - 1. Shoring and Re-shoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and re-shoring installation and removal.
- F. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- G. Field quality-control reports.
- H. Minutes of pre-installation conference.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
  - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
  - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.

1.8 PRECONSTRUCTION TESTING

- A. Pre-construction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.10 FIELD CONDITIONS

- A. 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°F (4.4°C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
  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.
- B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and as follows:
1. Maintain concrete temperature below 90°F (32°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.

PART 2 – PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301 (ACI 301M).
  2. ACI 117 (ACI 117M).

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
1. Plywood, metal, or other approved panel materials.
- B. 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.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

- D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- E. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- F. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
  - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- G. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish units that leave no corrodible metal closer than 1" (25 mm) to the plane of exposed concrete surface.
  - 2. Furnish ties that, when removed, leave holes no larger than" (25 mm) in diameter in concrete surface.
  - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

## 2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 60 (Grade 420), deformed bars, assembled with clips.
- D. Plain-Steel Wire: ASTM A 1064/A 1064M, galvanized.
- E. Deformed-Steel Wire: ASTM A 1064/A 1064M.
- F. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- G. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

## 2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.
- B. 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 supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

## 2.5 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:



1. Portland Cement: ASTM C 150/C 150M, Type I, Type II or Type I/II.
2. Fly Ash: ASTM C 618, Class F.
3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.

C. Normal-Weight Aggregates: ASTM C 33/C 33M, coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1" (25 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Air-Entraining Admixture: ASTM C 260/C 260M.

E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do 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.

F. Water: ASTM C 94/C 94M.

## 2.6 WATERSTOPS

A. Flexible Rubber Waterstops: CE CRD-C 513, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

B. Chemically Resistant Flexible Waterstops: Thermoplastic elastomer rubber waterstops, for embedding in concrete to prevent passage of fluids through joints; resistant to oils, solvents, and chemicals. Factory fabricate corners, intersections, and directional changes.

C. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

D. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).

## 2.7 VAPOR RETARDERS

A. Sheet Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.

B. Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 15 mils (0.25 mm) thick.

## 2.8 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

## 2.9 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

#### 2.10 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Semi-rigid Joint Filler: Two-component, semi-rigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 according to ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
  - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Reglets: Fabricate reglets of not less than 0.022" (0.55 mm) thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- F. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034" (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

#### 2.11 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8" (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150/C 150M, 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 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlay: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4" (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
  - 1. Cement Binder: ASTM C 150/C 150M, 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 (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

## 2.12 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 (ACI 301M).
  1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
  1. Fly Ash: 25 percent.
  2. Combined Fly Ash and Pozzolan: 25 percent.
  3. Slag Cement: 50 percent.
  4. Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.

## 2.13 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Refer to structural plans and notes for concrete properties.

## 2.14 FABRICATING REINFORCEMENT

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

## 2.15 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
  1. When air temperature is between 85 and 90°F (30 and 32°C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90°F (32°C), reduce mixing and delivery time to 60 minutes.

## PART 3 – EXECUTION

### 3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301 (ACI 301M), 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 (ACI 117M).
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
  1. Class A, 1/8" (3.2 mm) for smooth-formed finished surfaces.

2. Class B, 1/4:" (6 mm) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct 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. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
  2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
  3. Install dovetail anchor slots in concrete structures as indicated.

### 3.3 REMOVING AND REUSING FORMS

- A. 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°F (10°C) 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.
1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70% of its 28-day design compressive strength.
  2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.
- C. 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.

### 3.4 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 (ACI 318M) and ACI 301 (ACI 301M) for design, installation, and removal of shoring and re-shoring.
  - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

### 3.5 VAPOR-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
  - 1. Lap joints 6" (150 mm) and seal with manufacturer's recommended tape.
- B. Bituminous Vapor Retarders: Place, protect, and repair bituminous vapor retarder according to manufacturer's written instructions.

### 3.6 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting 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 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.

### 3.7 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" (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. Space vertical joints in walls 25'-0" maximum. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
  6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fifth of concrete thickness as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8" (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8" (3.2 mm) wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
  2. Terminate full-width joint-filler strips not less than 1/2" (13 mm) or more than 1" (25 mm) below finished concrete surface where joint sealants, specified in Section 07 92 00 "Joint Sealants," are indicated.
  3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

### 3.8 WATERSTOP INSTALLATION

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

### 3.9 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- 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 (ACI 301M).
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 is 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 not to 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 (ACI 301M).
  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" (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.

### 3.10 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, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.
- C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
  2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
  3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix 1 part portland cement and 1 part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent

surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

### 3.11 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. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4" (6 mm) in one direction.
1. Apply scratch finish to surfaces indicated and to receive mortar setting beds for bonded cementitious floor finishes.
- C. 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 indicated to receive trowel finish.
- D. 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 or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
  2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
    - a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. 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 before application.
- G. Special Exterior Slab Finishes

### 3.12 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- 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.



- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
1. Coordinate sizes and locations of concrete bases with actual equipment provided.
  2. Construct concrete bases 4" (100 mm) high unless otherwise indicated, and extend base not less than 6" (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
  3. Minimum Compressive Strength: 3000 psi (20.7 MPa) at 28 days.
  4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18" (450-mm) centers around the full perimeter of concrete base.
  5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
  6. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

### 3.13 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 (ACI 301M) 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 remainder of 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" (300-mm) 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" (300 mm), 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 does 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 does 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.

### 3.14 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
  1. Defer joint filling until concrete has aged at least two month(s). Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semi-rigid joint filler full depth in saw-cut joints and at least 2" (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

### 3.15 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 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) 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" (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4" (19 mm). 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 matches 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 (0.25 mm) 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" (6 mm) 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" (25 mm) 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" (19-mm) 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" (25 mm) 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's approval.

### 3.16 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/ C 172M shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
  2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
    - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40°F (4.4°C) and below or 80°F (27°C) and above, and one test for each composite sample.
  5. Compression Test Specimens: ASTM C 31/C 31M.
    - a. Cast and laboratory cure two sets of two standard cylinder specimens, or three for 4" diameter cylinders, for each composite sample.
    - b. Cast and field cure two sets of two standard cylinder, or three for 4" diameter, specimens for each composite sample at tilt-up wall panels.
  6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two, (or three) specimens at 28 days.
    - a. Test one set of two field-cured specimens at 7 days and one set of two, (or three) specimens at 28 days.
    - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
  7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
  8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
  9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
  10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
  11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
  12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
  13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- C. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 48 hours of finishing.

END OF SECTION 03 30 00

## SECTION 03 35 00 – CONCRETE FLOOR FINISHING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Floor sealer.
  - b. Slip-resistant abrasive aggregate.

#### 1.3 REFERENCES

- A. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Provide data on concrete sealer, and slip resistant treatment, compatibilities, and limitations.
- B. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- C. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:

1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATION SUBMITTALS

- A. Maintenance Data: Provide data on maintenance renewal of applied coatings.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's packaging including application instructions.

#### 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Temporary Lighting: Provide minimum 200 W light source, 8' above the floor surface, for each 425 sq. ft. of floor being finished.
- B. Temporary Heat: Ambient temperature of 50° F (10° C) minimum
- C. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

#### 1.8 FIELD CONDITION

- A. Coordinate the work with concrete floor placement and concrete floor curing.

#### 1.9 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS:

- A. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.

2.2 FLOOR SEALER: ACCEPTABLE PRODUCTS:

- A. "Superkote – Special Clear Sealer" manufactured by Ven-Chem Company, Inc.
- B. "Supershield – Clearseal" manufactured by James Darcey Company, Inc.

2.3 SLIP-RESISTANT ABRASIVE AGGREGATE:

- A. Provide aluminum oxide, 14/36 grading.
- B. Acceptable manufacturers:
  - 1. Carborundum Company;
  - 2. Norton Company;
  - 3. L. M. Scofield Company.

2.4 ENVIRONMENTAL

- A. Energy Performance: Provide roofing system with initial Solar Reflectance Index not less than 78 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency. Provide documentation indicating that roof materials comply with Solar Reflectance Index requirement.
- B. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- C. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Plastic Foam Adhesives: 50 g/L.
  - 2. Gypsum Board and Panel Adhesives: 50 g/L.
  - 3. Multipurpose Construction Adhesives: 70 g/L.
  - 4. Fiberglass Adhesives: 80 g/L.
  - 5. Contact Adhesive: 80 g/L.
  - 6. Other Adhesives: 250 g/L.
  - 7. Single-Ply Roof Membrane Sealants: 450 g/L.
  - 8. Nonmembrane Roof Sealants: 300 g/L.
  - 9. Sealant Primers for Nonporous Substrates: 250 g/L.
  - 10. Sealant Primers for Porous Substrates: 775 g/L.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that floor surfaces are acceptable to receive the work of this section.

3.2 GENERAL FINISHING

- A. See Drawings for locations and type of specialized floor finish and treatment in accordance with design intent. Contractor to coordinate with Architect for all field samples and installations.

3.3 FLOOR SURFACE TREATMENT INSTALLATION

- A. Apply sealer in accordance with manufacturer's instructions as scheduled.
- B. Apply slip resistant finish in accordance with manufacturer's instructions as scheduled.

3.4 SITE ENVIRONMENTAL PROCEDURES

- A. Indoor Air Quality: Provide temporary ventilation as specified – Indoor Air Quality (IAQ) Management.
- B. Waste Management: As specified – Construction Waste Management and as follows:
  - 1. Coordinate with manufacturer for take-back program. Set aside scrap to be returned to manufacturer for recycling into new product. Close and seal all partially used containers of paint to maintain quality as necessary for reuse.

END OF SECTION 03 35 00



## SECTION 03 45 00 – PRECAST ARCHITECTURAL CONCRETE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Architectural precast concrete units.

#### 1.3 REFERENCES

- A. ACI 117 – Standard Tolerances for Concrete Construction and Materials.
- B. ACI 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- C. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- D. Concrete Reinforcing Steel Institute, "Manual of Standard Practice.
- E. ACI 308 – Standard Practice for Curing Concrete.
- F. ACI 315 – Details and Detailing of Concrete Reinforcement.
- G. ACI347R – Guide to Formwork for Concrete.
- H. ASTM A185 – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- I. ASTM A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- J. ASTM A276 – Standard Specification for Stainless Steel Bars and Shapes.
- K. ASTM A580/A580M – Standard Specification for Stainless Steel Wire.
- L. ASTM A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- M. ASTM A666 – Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- N. ASTM A780/A780M – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- O. ASTM C33/C33M – Standard Specification for Concrete Aggregates.
- P. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.
- Q. ASTM C150/C150M – Standard Specification for Portland Cement.
- R. ASTM C260 – Specification for Air-Entraining Admixtures for Concrete.
- S. ASTM C404 – Standard Specification for Aggregates for Masonry Grout.
- T. ASTM C494 – Specification for Chemical Admixtures for Concrete.
- U. ASTM C642 – Standard Test Method for Density, Absorption, and Voids in Hardened Concrete.

- V. ASTM C1218/C1218M – Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
- W. ASTM F593 – Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
- X. ASTM F594 – Standard Specification for Stainless Steel Nuts.
- Y. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.
- C. Shop Drawings:
  - 1. Detail fabrication and installation of architectural precast concrete units.
  - 2. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.
  - 3. Indicate joints, reveals, drips, chamfers, and extent and location of each surface finish and details at building corners.
  - 4. Indicate type, size, and length of welded connections by AWS standard symbols. Detail loose and cast-in hardware, connections and anchorage.
  - 5. Indicate relationship of architectural precast concrete units to adjacent materials.
- D. Samples: Design reference samples for initial verification of design intent, for each type of finish indicated on exposed surfaces of architectural precast concrete units, in sets of three, representative of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches.
  - 1. When other faces of precast concrete unit are exposed, include Samples illustrating workmanship, color, and texture of backup concrete as well as facing concrete.
  - 2. Grout Samples: Color charts consisting of actual sections of grout showing manufacturer's full range of colors.
- E. Delegated-Design Submittal: Submit design calculations, analysis data and shop drawings indicating compliance with dedicated design requirements signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.
- F. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

- G. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include a list of completed projects with project name, addresses, names of architects and owners, and other information specified.
- B. Welder current certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.
- C. Material Certificates: Cementitious materials.
- D. Material Test Reports: For aggregates.

#### 1.6 MOCKUPS

- A. Before casting architectural concrete, build mockups to verify selections made under sample submittals and to demonstrate typical joints, surface finish, texture, tolerances, and standard of workmanship. Build mockups to comply with the following requirements, using materials indicated for the completed work.
- B. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
- C. Build mockups of each type of element of cast-in-place architectural concrete in a configuration as shown on drawings.
- D. Demonstrate curing, cleaning, and protecting of cast-in-place architectural concrete, finishes, and contraction joints, as applicable.
- E. In presence of Architect, damage part of the exposed-face surface for each finish, color, and texture, and demonstrate materials and techniques proposed for repair of tie holes and surface blemishes to match adjacent undamaged surfaces.
- F. Obtain Architect's approval of mockups before casting architectural concrete.

- G. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A precast concrete erector qualified and designated by PCI's Certificate of Compliance to erect Category A (Architectural Systems) for non-load bearing members.
- B. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground or other rehandling.
- B. Support units during shipment on nonstaining shock-absorbing material.
- C. Store units with adequate dunnage and bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.
- D. Place stored units so identification marks are clearly visible, and units can be inspected.
- E. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.
- F. Lift and support units only at designated points indicated on Shop Drawings.

#### 1.9 FIELD CONDITIONS

- A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

#### 1.10 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

#### 1.11 PERFORMANCE REQUIREMENTS

- A. Design Standards: Comply with ACI 318 (ACI 318M) and design recommendations of PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of architectural precast concrete units indicated.

- B. Delegated-Design: Provide design services, calculations and shop drawings for delegated design requirements complying with code requirements, performance requirements and design criteria signed and sealed by an engineer registered in the State of Florida.

## PART 2 - PRODUCTS

### 2.1 PRECAST ELEMENTS

- A. Provide precast elements as indicated on the drawings.

### 2.2 MOLD MATERIALS

- A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that provides continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.
- B. Mold-Release Agent: Commercially produced form-release agent that does not bond with, stain or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

### 2.3 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A185/A185M, fabricated from galvanized-steel wire into flat sheets.

### 2.4 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or Type III, unless otherwise indicated.
  - 1. For surfaces exposed to view in finished structure, use gray or white cement as selected by the Architect, of same type, brand, and mill source.
- B. Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C33/C33M, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
  - 1. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand compatible with coarse aggregate; to match approved finish sample.
- C. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.
- D. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.

- E. Coloring Admixture: ASTM C 979/C 979M, synthetic or natural mineral-oxide pigments or colored water-reducing admixtures, temperature stable, and nonfading.

## 2.5 GROUT MATERIALS

- A. Sand-Cement Grout: Portland cement, ASTM C150/C150M, Type I, and clean, natural sand, ASTM C144 or ASTM C404. Mix at ratio of 1 part cement to 2-1/2 to 3 parts sand, by volume, with minimum water required for placement and hydration. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C1218/C1218M.

## 2.6 CONCRETE MIXTURES

- A. Prepare design mixtures for each type of precast concrete required.
  - 1. Use a single design mixture for units with more than one major face or edge exposed.
  - 2. Where only one face of unit is exposed use either a single design mixture or separate mixtures for face and backup.
- B. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.
- C. Normal-Weight Concrete Mixtures: Proportion by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:
  - 1. Compressive Strength (28 Days): 5000 psi minimum.
  - 2. Maximum Water-Cementitious Materials Ratio: 0.45.
- D. Water Absorption: 6 percent by weight or 14 percent by volume, tested according to ASTM C 642, except for boiling requirement.

## 2.7 CONCRETE ADMIXTURES

- A. Content of admixtures will be required from the admixture manufacturer prior to mix design review by the Architect.
- B. Prohibited Admixtures: Calcium chloride or admixtures containing more than 0.05 percent chloride ions are not permitted.

## 2.8 CONNECTION MATERIALS

- A. General: Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation. Provide clips, hangers, high-density plastic or steel shims and other accessories required to install architectural precast concrete units.
- B. Stainless-Steel Plate: ASTM A 666, Type 304, Type 316, or Type 201.

- C. Stainless-Steel Bolts and Studs: ASTM F593, Alloy Group 1 or 2 (ASTM 738M, Grade A1 or A4) hex-head bolts and studs; ASTM F594, Alloy Group 1 or 2 (ASTM F836M, Grade A1 or A4) stainless-steel nuts; and flat, stainless-steel washers.
  - 1. Lubricate threaded parts of stainless-steel bolts with an anti-seize thread lubricant during assembly.
- D. Stainless-Steel-Headed Studs: ASTM A276, Alloy 304 or Alloy 316, with minimum mechanical properties of PCI MNL 117, Table 3.2.3.
- E. Materials: Provide ties and anchors suitable for precast concrete anchorage conditions and are made from materials that comply with the following unless otherwise indicated:
  - 1. Stainless-Steel Wire: ASTM A580/A580M, Type 304 or Type 316.
  - 2. Stainless-Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304 or Type 316.
- F. Precast Accessories: Provide clips, hangers, high-density plastic or steel shims, and other accessories required to install architectural precast concrete units.

## 2.9 MOLD FABRICATION

- A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes and for prestressing and detensioning operations. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of reinforcement and prestressing tendons by release agent.

## 2.10 FABRICATION

- A. Fabricate precast elements to shapes, configurations and sizes as indicated on drawings
- B. Cast-in Anchors, Inserts, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.
- C. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing architectural precast concrete units to supporting and adjacent construction.
- D. Cast-in slots, holes, and other accessories in architectural precast concrete units as indicated on the Contract Drawings.
- E. Cast-in openings larger than 10 inches in any dimension. Do not drill or cut openings or prestressing strand without Architect's approval.
- F. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement.

- G. Reinforce architectural precast concrete units to resist handling, transportation, and erection stresses and specified in-place loads.
- H. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.
- I. Place face mixture to a minimum thickness after consolidation of the greater of 1 inch or 1.5 times the maximum aggregate size, but not less than the minimum reinforcing cover specified.
- J. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.
  - 1. Place backup concrete mixture to ensure bond with face-mixture concrete.
- K. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 117.
- L. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.
- M. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that does not show in finished structure.
- N. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.
- O. Discard and replace architectural precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 117 and Architect's approval.

## 2.11 FABRICATION TOLERANCES

- A. Erect precast units level, plumb, square and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 117, Appendix I.
- B. Fabricate architectural precast concrete units to shapes, lines, and dimensions indicated so each finished unit complies with the following product tolerances:
  - 1. Overall Length and Width Tolerance of Units: Measured at 10 feet or under, plus or minus 1/8 inch.

## 2.12 FINISHES

- A. Exposed faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. Finish exposed-face surfaces of architectural precast concrete units as selected by the Architect.



1. Surface Finish: Smooth
2. Color as selected by the Architect.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, bearing surface tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Install clips, hangers, bearing pads, and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.
- B. Erect architectural precast concrete level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment of units until permanent connections are completed.
- C. Connect architectural precast concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.
- D. Welding: Comply with applicable requirements in AWS D1.1/D1.1M and AWS D1.4/D1.4M for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.
- E. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.
  1. For slip-critical connections, use method and inspection procedure approved by Architect and coordinated with inspection agency.
- F. Grouting or Dry-Packing Connections and Joints: Grout connections where required or indicated. Retain flowable grout in place until hard enough to support itself. Alternatively, pack spaces with stiff dry-pack grout material, tamping until voids are completely filled. Place grout and finish smooth, level, and plumb with adjacent concrete surfaces. Promptly remove grout material from exposed surfaces before it affects finishes or hardens. Keep grouted joints damp for not less than 24 hours after initial set.
- G. Water Repellant: Apply water repellant as per specification section "Water Repellants" and manufacturer's recommendations.

### 3.3 ERECTION TOLERANCES

- A. Erect architectural precast concrete units level, plumb, square, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 117, Appendix I.
- B. Erect architectural precast concrete units level, plumb, square, and in alignment, without exceeding a tolerance 1/4" in 10'-0".

### 3.4 REPAIRS

- A. Repair architectural precast concrete units if permitted by Architect. Architect reserves the right to reject repaired units that do not comply with requirements.
- B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet.
- C. Prepare and repair damaged galvanized coatings with galvanizing repair paint according to ASTM A 780/A 780M.
- D. Wire brush, clean, and paint damaged prime-painted components with same type of shop primer.
- E. Remove and replace damaged architectural precast concrete units when repairs do not comply with requirements.

### 3.5 CLEANING

- A. Clean surfaces of precast concrete units exposed to view.
- B. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.
- C. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.
  - 1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.
  - 2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 03 45 00

## SECTION 03 54 16 – HYDRAULIC CEMENT UNDERLAYMENT

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Hydraulic cement underlayment.

#### 1.3 REFERENCES

- A. ASTM C109 – Compressive Strength of Hydraulic Mortars.
- B. ASTM C191 – Setting Time of Hydraulic Cement.
- C. ASTM C627 – Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester.
- D. ASTM C1059 – Standard Specifications for Latex Agents for Bonding Fresh to Hardened Concrete.
- E. ASTM F710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- F. ASTM F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Submit product data for product indicated and include mixing and application instructions.
- B. Shop Drawings: Include plans indicating substrates, locations and average depths of underlayment based on substrate conditions.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Product Certificates: Signed by manufacturer of underlayment and floor covering systems certifying that products are compatible.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.

- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original undamaged packages or acceptable bulk containers.
- B. Store packaged materials to protect them from elements or physical damage.
- C. Do not use cement that shows indications of moisture damage, caking, or other deterioration.

#### 1.8 FIELD CONDITIONS

- A. Do not place material unless ambient temperature is at least 50 deg F and rising.

#### 1.9 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Quikrete Cement & Concrete Products
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Lambert Corp.
  - 2. BASF Construction Chemicals, Inc.

#### 2.2 MATERIALS

- A. Basis of Design: "Self-leveling Floor Resurfacer – Fast Setting (No. 1249-51)"
- B. Self-leveling portland cement based, self-finishing one component underlayment. Material can be up to 1" thick and then feathered at edges, minimum 1/4" thick at heavy traffic areas.

- C. Material shall conform to the following Performance and Physical Properties at 73 degrees F and 50 percent relative humidity:
  - 1. Working time, ASTM C 191: 20-40 minutes.
  - 2. Compressive Strength, ASTM C 109 Modified: 1800 psi at 24 hours,
  - 3. 4000 psi at 7 days, 5500 psi at 28 days.
  - 4. Slant Shear Bond Strength, ASTM C 1059: Exceeds 1250 psi at 28 days
  - 5. Walk on Time: 2-4 hours maximum.
  - 6. Tensile Bond Strength, ASTM C 1059: 300 psi at 7 days, 400 psi at 28 days.
  
- D. Water: Potable and at a temperature of not more than 70 deg. F.

### 2.3 ACCESSORIES

- A. Patching Material: FastSet Non-Shrink Grout (No. 1585-09).
- B. Bonding Adhesive: Bonding Adhesive (No. 9902).

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for conditions affecting performance of the Work.
- B. Proceed with application only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Prepare and clean substrate according to manufacturer's written instructions.
  - 1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
  - 2. Fill substrate voids to prevent underlayment from leaking.
- B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.
  - 1. Moisture Testing: Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/100 sq. m) in 24 hours.
- C. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces according to manufacturer's written instructions.
- D. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

### 3.3 APPLICATION

- A. General: Mix and apply underlayment components according to manufacturer's written instructions.
  - 1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
  - 2. Coordinate application of components to provide optimum adhesion to substrate and between coats.
  - 3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.
- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Apply underlayment to produce uniform, level surface.
  - 1. Apply a final layer without aggregate to product surface.
  - 2. Feather edges to match adjacent floor elevations.
- D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.
- E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.
- F. Apply surface sealer at rate recommended by manufacturer.
- G. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

### 3.4 PROTECTION

- A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION 03 54 16

## SECTION 04 05 00 - MASONRY GROUT

### PART 1 – GENERAL

#### 1.1 SUMMARY

- A. Section includes grout for masonry.
- B. Related Sections:
  - 1. Section 03 30 00 - Cast-In-Place Concrete
  - 2. Section 04 20 18 - Unit Masonry Assemblies
  - 3. Section 04 23 00 - Reinforced Unit Masonry
- C. The general provisions of the Contract, including General Conditions, Supplementary Conditions, and Special Conditions (if any) along with the General Requirements, apply to the work specified in this section.
- D. Examine all Drawings and all other Sections of the Specifications for requirement therein affecting the work of this trade.
- E. All materials and conditions described in this section shall be provided and installed in a manner that achieves the maximum Green Globe Certification.

#### 1.2 DEFINITIONS

- A. Contractor: State of Florida licensed General Contractor.
- B. Sub-contractor: Provides materials or services for the project through the Contractor.

#### 1.3 SUBMITTALS

- A. General:
  - 1. Submit all documents and samples in conformance to Specification Section 01 33 00.
  - 2. Electronic submittals are required and printed copies are not acceptable unless specifically allowed by contract with the Owner.
  - 3. Review of shop drawings does not constitute authorization to vary from the contract documents.
  - 4. Submittal Scheduling: The Contractor shall be responsible for scheduling submittals with ample time allotted for the review process and possible re-submittals.
- B. Manufacturer's Data:
  - 1. Submit manufacturer's product data, with application and installation instructions, for all proprietary materials and items relative to the grout work.
- C. Test Reports:
  - 1. Report test results in writing to the Architect, Engineer and Contractor immediately after tests are made.
  - 2. Reports of compressive strength tests shall contain the prism set number, product identification name and number, date of grout placement, name of Contractor, name of supplier, truck number, name of testing service, grout type and class, location of grout batch in structure, design compressive strengths at 28 days, compressive breaking strength, slump, air temperature, weather, and any water added after leaving the plant.

#### 1.4 QUALITY ASSURANCE

- A. Codes and Standards:
1. Comply with the provisions of the latest editions of the following codes, specifications and standards, except as shown or specified.
  2. Where provisions of these codes and standards are in conflict with the building code in force for this project, the more stringent requirement shall govern.
    - a. American Concrete Institute: ACI 530 and ASCE 5, Building Code Requirements for Masonry Structures.
    - b. American Concrete Institute: ACI 530.1 and ASCE 6, Specification for Masonry Structures.
    - c. American Society for Testing Materials (ASTM): All ASTM Standards shall apply where appropriate.
- B. Workmanship:
1. The Contractor is responsible for correction of grout work which does not conform to the specified requirements, including strength, tolerances and finish.
  2. Deficiencies shall be corrected as directed by the Architect and as specified herein, at no additional cost to the Owner.
- C. Grout Testing Service:
1. The Contractor shall employ and pay all costs for an independent testing laboratory, acceptable to the Architect and Engineer, to perform required tests during construction.
  2. Contractor shall notify laboratory three days in advance of schedule for grout placement and allow free access to the site for testing operations.
- D. Material Sources:
1. Sources of materials must remain unchanged during the course of the work.
  2. Any variation in materials will require retesting.
  3. Certificates of material properties and compliance with specified requirements may be submitted in lieu of testing, when acceptable to the Architect, provided that the proposed materials have a satisfactory service record and have been tested within the past year and such previous tests have met the specified requirements.
  4. Certificates of compliance for each material must be signed by the Contractor and the supplier.
- E. Advanced Design Mix:
1. Comply with ASTM C 476. The Contractor shall furnish mix designs for each type of grout (i.e., aggregate size, slump, etc.) anticipated to be provided throughout the project. Furnish at least 14 days prior to any grout placement.
  2. Mix designs shall be prepared by a qualified independent testing laboratory or the grout supplier's laboratory.
- F. Quality Control Tests During Construction:
1. Grout shall be sampled and tested for adequacy of design for strength.
  2. Test prisms shall be made, stored and tested by the testing laboratory.
  3. Protect test prisms while stored on site.
  4. Handle and store carefully prior to testing.
  5. Grout shall be sampled and tested as follows:
    - a. Slump: Comply with ASTM C 143. One test for each set of prisms, taken at point of placement in the structure. Additional slump tests may be required when observed slumps appear to exceed the allowed limit.
    - b. Test Prisms: Comply with ASTM C 1019. Make one set of three test prisms for each 30 cubic yards, or fraction thereof, of each mix design of grout placed in any one day.



- c. Compressive Strength Tests: Comply with ASTM C 617 and C 39. Test 1 prism at 7 days and 2 at 28 days. Additional samples shall be taken whenever there is any change in mix proportions, method of mixing, or materials used.
- d. Tests of In-Place Grout: Testing service shall make additional tests of in-place grout when results indicate that specified grout strengths or other characteristics, such as complete filling of masonry cores, have not been met. Costs of tests shall be at Contractor's expense.

G. Perform Work in accordance with State of Florida and City of Orange Park, Florida's standards.

H. Maintain one copy of each document on site.

## 1.5 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40°F.

B. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100°F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

## PART 2 - PRODUCTS

### 2.1 MORTAR MATERIALS

A. Cement: Portland Cement complying with ASTM C 150, Type I or Type III.

B. Lime: Hydrated Lime, Type S, complying with ASTM C 207.

C. Coarse Stone Aggregate: Crushed stone, rock or gravel complying with ASTM C 404 and C 33. Maximum size 3/8 inch with no material smaller than No. 30 sieve size.

D. Fine Aggregate: Clean, sharp silica or quartz sand complying with ASTM C 404.

E. Special Considerations: Aggregate shall be free of soft or friable particles and be free of unfavorable capillary absorption characteristics.

### 2.2 WATER

A. Clean, fresh, potable, free from acid, oil or other injurious matter.

### 2.3 ADMIXTURES

A. General:

1. No admixture shall be used in the manufacturer of grout without prior acceptance of the Architect.
2. When any accepted admixture is used in the grout, the compressive strength, bond strength and flexural strength shall not be less than that of the specified grout strengths without admixtures.
3. Volume change of grout shall not be more with admixtures than without admixtures.
4. No grout ingredient shall contain more than 0.1% chloride ions or the amount present in municipal drinking water, whichever is less.

## PART 3 - EXECUTION

### 3.1 MASONRY GROUT QUALITY

- A. General: Grout to be used for reinforced masonry shall comply with ASTM C 476 and as follows.
- B. Mixing:
  - 1. Proportions:
    - a. Fine Grout: For spaces (masonry cells) not exceeding 3", grout mix shall consist of one (1) part Portland Cement, 0 to 1/10 part hydrated lime, and sand at 2-1/2 times the sum of the volumes of the cementitious materials.
    - b. Coarse Grout: For spaces (masonry cells) greater than 3", grout mix shall consist of one (1) part Portland Cement, 0 to 1/10 part hydrated lime, sand (fine aggregate) at 2 times the sum of the volumes of the cementitious materials, and coarse aggregate at 2 times the sum of the volumes of the cementitious materials.
    - c. Water: Add enough water to bring grout to a consistency as fluid as possible without causing segregation of materials.
- C. Strength
  - 1. All grout shall have a minimum compressive strength at 28 days of 2,500 psi or as required by ASTM C 476, whichever is the greater.
- D. Slump
  - 1. Comply with ASTM C 143. Slump shall be 8" to 10" at point of placement in structure.

### 3.2 READY-MIX GROUT

- A. If ready-mixed grout is used, the grout shall be mixed and delivered in accordance with the requirements set forth in ASTM C 94.
- B. Mixers shall be in proper working order and appropriate for the intended use.
- C. Mixer blades shall not have their height reduced by more than one inch.
- D. Blades showing more wear than this shall be replaced or the mixer shall not be used.
- E. Mixers shall be equipped with accurate and dependable water measuring devices.
- F. Grout shall not be placed if it has been in the mixer for more than one and one-half hours after addition of the water or after grout has begun to heat up due to hydration.

### 3.3 GROUT PLACEMENT

- A. General:
  - 1. Grout shall be placed by the High-Lift or Low-Lift method of grouting.
  - 2. Pump or place a uniform height of grout in maximum 5 foot lifts and immediately vibrate the grout.
  - 3. Grout vibrations shall be performed not longer than 10 minutes after grout lift placement.
- B. High-Lift Grouting:
  - 1. Pour succeeding 5 foot (maximum) lifts after waiting 30 to 60 minutes to allow for settlement and absorption of excess water.
  - 2. Reconsolidate top lift of pour after the required waiting period and fill any void left by settlement shrinkage with grout.
- C. Low-Lift Grouting:

1. Rod or vibrate each grout lift during pouring operation, and again after excess moisture has been absorbed, but before plasticity is lost.

D. Preparation for Placement:

1. Prior to grout placement, remove all mortar droppings, protruding mortar, foreign materials or debris from masonry cells and lintels to be filled with grout.
2. The minimum clear vertical cell shall be 3" square or as required to properly position detailed reinforcing and provide specified clearances.
3. Notify Architect and inspection authorities at least 72 hours prior to a scheduled pour.

3.4 BONDING

- A. General: If complete grouting of a scheduled pour cannot be completed, or time between placement of lifts will exceed the specified time, hold grout a minimum of 1-1/2" down from mortar joint to provide a horizontal key between successive lifts.

3.5 EMBEDDED ITEMS

A. General:

1. Set and build into the work any anchorage devices, steel angles and plates, or other embedded items required for the work that is attached to, or supported by reinforcement masonry.
2. Use setting drawings, diagrams, instructions and directions provided by the supplier of the items to be attached.
3. Where structural steel shapes and other members are shown bolted to the reinforced masonry, bolts shall be set in proper position and spacing in the masonry units before the grout is placed.
4. Bolts and nuts exposed to moisture conditions shall be galvanized.

END OF SECTION 04 05 00



## SECTION 04 10 22 – MASONRY INFILL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Repairing voids in masonry.

#### 1.3 REFERENCES

- A. ASTM A641/A641M – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
- B. ASTM A951/A951M – Standard Specification for Steel Wire for Masonry Joint Reinforcement.
- C. ASTM A1064/A1064M – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- D. ASTM C90 – Standard Specification for Loadbearing Concrete Masonry Units.
- E. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.
- F. ASTM C150 – Standard Specification for Portland Cement.
- G. ASTM C1392/C1392M – Standard Specification for Mortar Cement.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include recommendations for product application and use. Include test data substantiating that products comply with requirements.

#### 1.5 QUALITY ASSURANCE

- A. Mockups: Prepare mockups of brick masonry repair to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.
  - 1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit brick masonry repair work to be performed according to product manufacturers' written instructions and specified requirements.

1.8 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

PART 2 - PRODUCTS

2.1 MASONRY MATERIALS

- A. Shapes: Provide shapes with exposed surfaces matching existing exposed faces of adjacent units.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed work and will be within 20 feet vertically and horizontally of a walking surface.
- C. CMUs: ASTM C 90.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi.
  - 2. Density Classification: Normal weight.
  - 3. Size and Shape: Match existing.
  - 4. Exposed Faces: Provide texture matching existing.

2.2 MORTAR MATERIALS

- A. Mortar Cement: ASTM C 1329/C 1329M.
- B. Mortar Sand: ASTM C 144.

1. Exposed Mortar: Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.

C. Water: Potable.

## 2.3 REINFORCEMENT

- A. Masonry-Joint Reinforcement, General: Ladder type complying with ASTM A 951/A 951M.
- B. Mill-Galvanized, Carbon-Steel Wire: ASTM A 1064/A 81064M, with ASTM A 641/A 641M, Class 1 coating.
- C. Corrugated-Metal Ties: Metal strips not less than 7/8 inch wide with corrugations having a wavelength of 0.3 to 0.5 inch and an amplitude of 0.06 to 0.10 inch made from 0.075-inch thick steel sheet, galvanized after fabrication.

## 2.4 MORTAR MIXES

- A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
- B. Do not use admixtures in mortar unless otherwise indicated.

## PART 3 - EXECUTION

### 3.1 MASONRY REPAIR, GENERAL

- A. Appearance Standard: Repaired surfaces are to have a uniform appearance as viewed from 20 feet away by Architect.

### 3.2 MASONRY INSTALLATION GENERAL

- A. Install masonry into bonding and coursing pattern. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
  1. Use setting buttons or shims to set units accurately spaced with uniform joints.
- B. Lay masonry with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with enough mortar to fill head joints and shove into place. Wet both replacement and surrounding masonry.
  1. Tool exposed mortar joints in infill areas flush.

### 3.3 MASONRY-JOINT REINFORCEMENT

- A. General: Install horizontal reinforcing the entire length in mortar with a minimum cover of 5/8 inch on exterior side of walls and lap reinforcement a minimum of 6 inches. Space reinforcement not more than 16 inches o.c.

- B. Install metal ties where horizontal reinforcing meets vertical wall surface of opening.

### 3.4 MASONRY INSTALLATION

- A. Rinse surface to be infilled and leave damp, but without standing water.
- B. Brush-coat surfaces with slurry coat of mortar compound.
- C. Place mortar compound in layers, but not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.
- D. Trowel, scrape, or carve surface of infill areas flush with surrounding surface plane. Shape and finish surface before or after curing, as determined by testing.
- E. Keep each layer damp for 72 hours or until patching compound has set.

### 3.5 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water applied by low-pressure spray.
  - 1. Do not use metal scrapers or brushes.
  - 2. Do not use acidic or alkaline cleaners.
- B. Clean adjacent non-masonry surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Remove masking materials, leaving no residues that could trap dirt.

END OF SECTION 04 10 22



## SECTION 04 10 24 – MASONRY REPAIR

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Repairing voids in masonry.

#### 1.3 REFERENCES

- A. ASTM C90 – Standard Specification for Loadbearing Concrete Masonry Units.
- B. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.
- C. ASTM C1392/C1392M – Standard Specification for Mortar Cement.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include recommendations for product application and use. Include test data substantiating that products comply with requirements.

#### 1.5 QUALITY ASSURANCE

- A. Mockups: Prepare mockups of brick masonry repair to demonstrate aesthetic effects and to set quality standards for materials and execution and for fabrication and installation.
  - 1. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

#### 1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit brick masonry repair work to be performed according to product manufacturers' written instructions and specified requirements.

#### 1.8 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

### PART 2 - PRODUCTS

#### 2.1 MASONRY MATERIALS

- A. Shapes: Provide shapes with exposed surfaces matching existing exposed faces of adjacent units.
- B. CMUs: ASTM C 90.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi
  - 2. Density Classification: Normal weight.
  - 3. Size and Shape: Match existing.
  - 4. Exposed Faces: Provide texture matching existing.

#### 2.2 MORTAR MATERIALS

- A. Mortar Cement: ASTM C 1329/C 1329M.
- B. Mortar Sand: ASTM C 144.
  - 1. Exposed Mortar: Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
- C. Water: Potable.

#### 2.3 MORTAR MIXES

- A. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.

- B. Do not use admixtures in mortar unless otherwise indicated.

### PART 3 - EXECUTION

#### 3.1 MASONRY REPAIR, GENERAL

- A. Appearance Standard: Repaired surfaces are to have a uniform appearance as viewed from 20 feet away by Architect.

#### 3.2 MASONRY INSTALLATION REPLACEMENT

- A. Install masonry into bonding and coursing pattern of existing masonry. If cutting is required, use a motor-driven saw designed to cut masonry with clean, sharp, unchipped edges.
  - 1. Maintain joint width for replacement units to match existing joints.
  - 2. Use setting buttons or shims to set units accurately spaced with uniform joints.
- B. Lay replacement masonry with rebuilding (setting) mortar and with completely filled bed, head, and collar joints. Butter ends with enough mortar to fill head joints and shove into place. Wet both replacement and surrounding masonry.
  - 1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing masonry.

#### 3.3 MASONRY UNIT PATCHING

- A. Patch the following masonry units:
  - 1. Patch masonry units with voids and holes.
  - 2. Remove loose material from masonry surface. Carefully remove additional material so patch does not have feathered edges but has square or slightly undercut edges on area to be patched and is at least 1/4 inch thick, but not less than recommended by patching compound manufacturer.
  - 3. Rinse surface to be patched and leave damp, but without standing water.
  - 4. Brush-coat surfaces with slurry coat of mortar compound.
  - 5. Place mortar compound in layers, but not less than 1/4 inch or more than 2 inches thick. Roughen surface of each layer to provide a key for next layer.
  - 6. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane of masonry unit. Shape and finish surface before or after curing, as determined by testing, to best match existing masonry unit.
  - 7. Keep each layer damp for 72 hours or until patching compound has set.

#### 3.4 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water applied by low-pressure spray.

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1. Do not use metal scrapers or brushes.
  2. Do not use acidic or alkaline cleaners.
- B. Clean adjacent non-masonry surfaces. Use detergent and soft brushes or cloths.
- C. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Remove masking materials, leaving no residues that could trap dirt.

END OF SECTION 04 10 24

## SECTION 04 20 00 - UNIT MASONRY

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Section 1 General Requirements, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following:
1. Concrete masonry.
  2. Reinforced unit masonry.
  3. Thru wall flashing.
  4. Unit drainage system.
- B. Related Sections
1. Division 7 Section "Sheet Metal Flashing and Trim" for exposed sheet-metal flashing installed in masonry and sill pans.
  2. Section 09 91 13 "Exterior Painting" for water repellent applied to Masonry.
- C. Products installed but not furnished under this Section include the following:
1. Manufactured reglets in masonry joints for metal flashing specified in Division 7 Section "Sheet Metal Flashing and Trim".
  2. Hollow metal frames in unit masonry openings specified in Division 8 Sections.
  3. Foamed-in-place Masonry Insulation specified in Section 07 21 19 "Foamed in Place Insulation."

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops the following installed compressive strengths (f'm) at 28 days.
- B. For concrete unit masonry: as follows based on net area:
1. As indicated on the structural drawings.

#### 1.4 SUBMITTALS

- A. Product Data for each different masonry unit, accessory and other manufactured product specified. This includes, but not limited to, CMU, reinforcement, through wall flashing, unit drainage system and mortar / grout.
- B. Shop drawings for reinforcing detailing fabrication, bending and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcement" showing bar schedules, stirrup spacing, diagrams of bent bars and arrangement of masonry reinforcement.
- C. Shop Drawings for precast lintels, if used.
- D. Material test reports for the following:
1. Mortar complying with property requirements of ASTM C 270.
  2. Mortar complying with BIA M1.
  3. Grout mixes. Include description of type and proportions of grout ingredients.
  4. Masonry units.

- E. Submit letter of certificate for the use of Dry-Block admixture in masonry units.
- F. Submit control joint material and cut sheets.

#### 1.5 QUALITY ASSURANCE

- A. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
- B. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.
- C. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Store masonry units on elevated platforms, under cover and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion and other causes. If units become wet, do not install until they are in an air-dried condition.
- B. Store cementitious materials on elevated platforms, under cover and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

#### 1.7 PROJECT CONDITIONS

- A. Protection of Masonry: During erection, cover tops of walls, projections and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- B. Do not apply uniform roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
  - 2. Protect sills, ledges and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen sub-grade or setting beds. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements:
  - 1. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:
    - a. 40 to 32°F: Heat mixing water or sand to produce mortar temperatures between 40 and 120°F.
    - b. 32 to 25°F: Heat mixing water and sand to produce mortar temperatures between 40

- and 120°F. Heat grout materials to produce grout temperatures between 40 and 120°F. Maintain mortar and grout above freezing until used in masonry.
2. Cold-Weather Protection: When the mean daily temperature is within the limits indicated, provide the following protection:
    - a. 40 to 25°F: Cover masonry with a weather-resistant membrane for 48 hours after construction.
  3. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40°F and above and will remain so until masonry has dried out, but not less than 7 days after completion of cleaning.
- E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100°F and above.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
1. Portland Cement, Mortar Cement, Masonry Cement, and Lime:
    - a. Essroc Materials, Inc.
    - b. Glen-Gery Corporation.
    - c. Lafarge Corporation.
    - d. Lehigh Portland Cement Co.
    - e. Riverton Corporation (The).
    - f. National Cement Company, Inc.
    - g. Holcim (US) Inc.
    - h. Capital Materials Corporation; Flamingo Color Masonry Cement.
  2. Joint Reinforcement, Ties, and Anchors:
    - a. Dur-O-Wal, Inc.
    - b. Heckman Building Products, Inc.
    - c. Hohmann & Barnard, Inc.
    - d. Masonry Reinforcing Corp. of America.
    - e. National Wire Products Industries.
    - f. Southern Construction Products.

### 2.2 CONCRETE MASONRY UNITS

- A. General: Provide shapes indicated and as follows for each form of concrete masonry unit required.
1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
  2. Provide square-edged units for outside corners.
- B. Concrete Masonry Units: ASTM C 90 and as follows:
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength indicated below:
    - a. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated on plans.
  2. Weight Classification: Normal weight.
  3. Provide Type I, moisture-controlled units.
  4. Size: Manufactured to the actual dimensions listed below (within tolerances specified in the applicable referenced ASTM specification) for the corresponding nominal sizes indicated on Drawings:

- a. 8" nominal: 7-5/8" actual.
- b. 16" nominal: 15-5/8" actual.

### 2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch, use aggregate graded with 100% passing the No. 16 sieve.
- D. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.
- E. Water: Potable.

### 2.4 REINFORCING STEEL

- A. Steel Reinforcing Bars: Material and grade as follows:
  - 1. Billet steel complying with ASTM A 615.
    - a. Grade 60 (Grade 400).
- B. Deformed Reinforcing Wire: ASTM A 496, with ASTM A 153, Class B-2 zinc coating.

### 2.5 JOINT REINFORCEMENT

- A. General: Provide joint reinforcement formed from the following:
  - 1. Galvanized carbon-steel wire, coating class as follows: ASTM A 153, Class B-2, for both interior and exterior walls.
- B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet, with prefabricated corner and tee units, and complying with requirements indicated below:
  - 1. Wire Diameter for Side Rods: 0.1483 inch.
  - 2. Wire Diameter for Cross Rods: 0.1483 inch.
- C. For single-wythe masonry, provide type as follows with single pair of side rods:
  - 1. Ladder type design with continuous diagonal cross rods spaced not more than 16" o.c.
  - 2. Provide prefabricated corner and tee sections as required.

### 2.6 TIES AND ANCHORS, GENERAL

- A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of this Article, unless otherwise indicated.
- B. Wire: As follows:
  - 1. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
  - 2. Wire Diameter: 0.1875 inch.

### 2.7 BENT WIRE TIES

- A. Individual units prefabricated from bent wire to comply with requirements indicated below:
  - 1. Tie Shape for Hollow Masonry Units Laid with Cells Vertical: Rectangular with closed ends and



not less than 4" wide.

## 2.8 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35%; of width and thickness indicated; formulated from the following material:
  - 1. Neoprene.
- B. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- C. Concrete Masonry Unit Drainage System
  - 1. #BN120 CMU Drainage System as manufactured by Mortar Net, Inc., Gary IN, 800-664-6638 or equivalent.

## 2.9 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: manufacturer's standard strength, general purpose cleaner designed for removing mortar/grout stains, efflorescence and other new construction stains from new masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned.
- B. Available Products: Subject to compliance with requirements, products that may be used to clean unit masonry surfaces include, but are not limited to the following:
  - 1. 202 New Masonry Detergent; Diedrich Technologies, Inc.
  - 2. 200 Lime Solv; Diedrich Technologies, Inc.
  - 3. 202V Vana-Stop; Diedrich Technologies, Inc.
  - 4. Sure Klean No. 600 Detergent; ProSoCo, Inc.
  - 5. Sure Klean No. 101 Lime Solvent; ProSoCo, Inc.
  - 6. Sure Klean Vana Trol; ProSoCo, Inc.

## 2.10 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including air-entraining agents, accelerators, retarders, anti-freeze compounds or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for job-mixed mortar; and ASTM C 1142 for ready-mixed mortar, of types indicated below:
  - 1. Limit cementitious materials in mortar to portland cement and lime.
  - 2. For masonry below grade in contact with earth, and where indicated, use Type S.
  - 3. For exterior, above-grade, load-bearing use Type M or S.
- C. Grout for Unit Masonry: Comply with ASTM C 476. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement that will completely fill spaces intended to receive grout.
  - 1. Use fine grout in grout spaces less than 2 inches in horizontal dimension, unless otherwise indicated.
  - 2. Use coarse grout in grout spaces 2 inches or more in least horizontal dimension, unless otherwise indicated.

## 2.11 SOURCE QUALITY CONTROL

- A. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested for strength, absorption and moisture content per ASTM C 140.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of unit masonry. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.

### 3.2 INSTALLATION, GENERAL

- A. Thickness: Build single-wythe walls to the actual thickness of the masonry units, using units of thickness indicated.
- B. Leave openings for equipment to be installed before completion of masonry. After installing equipment, complete masonry to match construction immediately adjacent to the opening.
- C. Cut masonry units with motor-driven saws to provide clean, sharp, un-chipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

### 3.3 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of walls and arrises, do not exceed  $\frac{1}{4}$ " in 10', nor  $\frac{3}{8}$ " in 20', nor  $\frac{1}{2}$ " in 40' or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed  $\frac{1}{4}$ " in 20', nor  $\frac{1}{2}$ " in 40' or more. For vertical alignment of head joints, do not exceed plus or minus  $\frac{1}{4}$ " in 10', nor  $\frac{1}{2}$ " maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed  $\frac{1}{4}$ " in 20', nor  $\frac{1}{2}$ " in 40' or more. For top surface of bearing walls, do not exceed  $\frac{1}{8}$ " in 10', nor  $\frac{1}{16}$ " within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partitions, do not exceed  $\frac{1}{2}$ " in 20', nor  $\frac{3}{4}$ " in 40' or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus  $\frac{1}{4}$ " nor plus  $\frac{1}{2}$ ".
- E. Variation in Mortar-Joint Thickness: Do not vary from bed-joint thickness indicated by more than plus or minus  $\frac{1}{8}$ ", with a maximum thickness limited to  $\frac{1}{2}$ ". Do not vary bed-joint thickness from bed-joint thickness of adjacent course by more than  $\frac{1}{8}$ ". Do not vary from head-joint thickness indicated by more than plus or minus  $\frac{1}{8}$ ". Do not vary head-joint thickness from adjacent head-joint thickness by more than  $\frac{1}{8}$ ". Do not vary from collar-joint thickness indicated by more than minus  $\frac{1}{4}$ " or plus  $\frac{3}{8}$ ".

### 3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- B. Install concrete masonry unit drainage system in accordance with manufacturers written instructions.
- C. Lay walls to comply with specified construction tolerances, with courses accurately spaced and

coordinated with other construction.

- D. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar prior to laying fresh masonry.
- E. Built-in Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- F. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
- H. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

### 3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units as follows:
  - 1. With full mortar coverage on horizontal and vertical face shells.
  - 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
  - 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
  - 4. Maintain joint widths indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 3/8" joints.
- B. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

### 3.6 MASONRY-CELL INSULATION

- A. Install per Section 07 21 19 – Foamed in Place Insulation

### 3.7 HORIZONTAL-JOINT REINFORCEMENT

- A. General: Provide continuous horizontal-joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2" elsewhere. Lap reinforcing a minimum of 6".
  - 1. Space reinforcement not more than 16" o.c.
  - 2. Provide reinforcement in mortar joint 1 block course above and below wall openings and extending 12" beyond opening.
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

### 3.8 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joints in unit masonry where indicated. Build-in related items as the masonry progresses. Do not form a continuous span through movement joints unless

provisions are made to prevent in-plane restraint of wall or partition movement.

- B. Form control joints in concrete masonry as follows:
  - 1. Fit bond-breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.

### 3.9 LINTELS

- A. Provide masonry lintels where shown and where openings of more than 12" for brick size units and 24" for block size units are shown without structural steel or other supporting lintels.
  - 1. Provide lintels as specified on the structural drawings matching concrete masonry units compressive strength as required to support loads indicated. Exposed portions of installed lintels to be painted to match masonry units.
- B. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

### 3.10 THRU WALL FLASHING

- A. In masonry thru wall flashing details used Pre-Kleened EPDM thruwall flashing by Carlisle. Install as per manufacturers instructions.
- B. Install weep holes in the head joints in exterior wythes of masonry as indicated on drawings.
  - 1. Space weep holes 16" o.c.

### 3.11 INSTALLATION OF REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.
  - 1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
- B. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
  - 1. Do not exceed the following pour heights for fine grout:
    - a. For minimum widths of grout spaces of  $\frac{3}{4}$ " or for minimum grout space of hollow unit cells of 1-1/2 by 2", pour height of 12".
    - b. For minimum widths of grout spaces of 2" or for minimum grout space of hollow unit cells of 2 by 3", pour height of 60".
    - c. For minimum widths of grout spaces of 2-1/2" or for minimum grout space of hollow unit cells of 2-1/2 by 3", pour height of 12'.
    - d. For minimum widths of grout spaces of 3" or for minimum grout space of hollow unit cells of 3 by 3", pour height of 24'.
  - 2. Do not exceed the following pour heights for coarse grout:
    - a. For minimum widths of grout spaces of 1-1/2" or for minimum grout space of hollow unit cells of 1-1/2 by 3", pour height of 12".
    - b. For minimum widths of grout spaces of 2" or for minimum grout space of hollow unit cells of 2-1/2 by 3", pour height of 60".
    - c. For minimum widths of grout spaces of 2-1/2" or for minimum grout space of hollow unit cells of 3 by 3", pour height of 12'.
    - d. For minimum widths of grout spaces of 3" or for minimum grout space of hollow unit cells of 3 by 4", pour height of 24'.
  - 3. Provide cleanout holes at least 3" in least dimension for grout pours over 60" in height.

- a. Provide cleanout holes at each vertical reinforcing bar.
- b. At solid grouted masonry, provide cleanout holes at not more than 32" o.c.

### 3.12 FIELD QUALITY CONTROL

- A. Contractor shall employ and pay a qualified independent testing agency to perform the following testing for field quality control. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.
- B. Testing Frequency: Tests and Evaluations listed in this Article will be performed during construction for each 5000 sq. ft. (460 sq. m) of wall area or portion thereof.
- C. Mortar composition and properties will be evaluated per ASTM C 780.
- D. Grout will be sampled and tested for compressive strength per ASTM C 1019.
- E. Prism-Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM E 447, Method B, and as follows:
  1. Prepare 1 set of prisms for testing at 7 days and 1 set for testing at 28 days.
- F. Evaluation of Quality-Control Tests: In the absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality-control tests comply with minimum requirements indicated.

### 3.13 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point-up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears prior to tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  2. Test cleaning methods on sample wall panel; leave one-half of panel un-cleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
  4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
  5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain present on exposed surfaces.
- E. Protection: Provide final protection and maintain conditions that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION 04 20 00



## SECTION 04 21 13 – BRICK MASONRY VENEER

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Face brick at cavity walls.
  - b. Mortar and grout.
  - c. Joint reinforcing, ties and anchors.
  - d. Miscellaneous masonry accessories.
  - e. Installation of steel lintels and shelf angles.

#### 1.3 REFERENCES

- A. ASTM A82 – Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
- B. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- C. ASTM A167 – Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- D. ASTM A366 – Standard Specification for Commercial Steel (CS) Sheet, Carbon (0.15 Maximum Percent) Cold Rolled.
- E. ASTM A510 – Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel.
- F. ASTM A951 – Standard Specification for Steel Wire for Masonry Joint Reinforcement.
- G. ASTM A580 – Standard Specification for Stainless Steel Wire.
- H. ASTM C67 – Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
- I. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.
- J. ASTM C150 – Standard Specification for Portland Cement.
- K. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes.
- L. ASTM C270 – Standard Specification for Mortar for Unit Masonry.
- M. ASTM C 920 – Standard Specification for Elastomeric Joint Sealants.
- N. ASTM D412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
- O. ASTM D638 – Standard Test Method for Tensile Properties of Plastics.
- P. ASTM D1056 – Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.
- Q. ASTM E2178 – Standard Test Method for Air Permeance of Building Materials.
- R. ACI 530/ASCE 5/TMS 402 – Building Code Requirements for Masonry Structures.

- S. ACI 530.1 /ASCE 6/TMS 602 – Specifications for Masonry Structures.
- T. National Concrete Masonry Association (NCMA), including “TEK Bulletins.”
- U. Portland Cement Association (PCA), “Concrete Masonry Handbook.”

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For the following:
  - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
  - 2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Samples for Initial Selection:
  - 1. Face brick.
  - 2. Masonry accessories.
  - 3. Cavity drainage material.
  - 4. Colored mortar.
  - 5. Weeps/vents.
- D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
  - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
  - 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- E. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- F. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.



3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

## 1.5 INFORMATIONAL SUBMITTALS

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- B. Material Certificates: For each type and size of the following:
1. Masonry units.
    - a. Include data on material properties.
    - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
    - c. For exposed brick, include test report for efflorescence according to ASTM C 67.
  2. Cementitious materials. Include brand, type, and name of manufacturer.
  3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
  4. Grout mixes. Include description of type and proportions of ingredients.
  5. Anchors, ties, and metal accessories.

## 1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- C. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- D. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- E. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

#### 1.7 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
- B. Build mockups for typical exterior wall in sizes approximately 8' high with a right angle corner with a 6' and a 4' leg by full thickness, including face and backup wythes and accessories.
  1. Include a sealant-filled joint at least 16 inches long in exterior wall mockup.
  2. Include lower corner of window opening in exterior wall mockup.
  3. Include precast concrete one-piece window sill.
  4. Include through-wall flashing installed for a 24-inch length in corner of exterior wall mockup approximately 16 inches down from top of mockup, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).
  5. Include water-resistive barrier, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.
- C. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
- D. Protect accepted mockups from the elements with weather-resistant membrane.
- E. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
  1. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
  2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- F. Mock-up shall be built separately independent from the structure and shall remain and be maintained during the course of construction.

#### 1.8 PRE-INSTALLATION MEETING

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

#### 1.9 PRECONSTRUCTION TESTING SERVICE

- A. A qualified independent testing agency shall perform preconstruction testing indicated below. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

- B. Testing Prior to Construction: One set of tests.
- C. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.
- D. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- E. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for mortar air content and compressive strength.
- F. Grout Test (Compressive Strength): For each mix required, according to ASTM C 1019.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

#### 1.11 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

#### 1.12 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

#### 1.13 PERFORMANCE

- A. Standards: Comply with the most recent edition of the following:
  - 1. National Concrete Masonry Association (NCMA), including "TEK Bulletins".
  - 2. American Concrete Institute (ACI), ACI 530/ASCE 5/TMS; and ACI 530.1/ASCE 6.
  - 3. Portland Cement Association (PCA), "Concrete Masonry Handbook".

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Endicott Brick
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities and appearance of the basis of design product.
  - 1. Belden Brick
  - 2. Cherokee Brick and Tile
  - 3. Taylor Clay Products
  - 4. Oldcastle
  - 5. Carolina Ceramics Brick Company

2.2 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

2.3 FACE BRICK

- A. General: Provide shapes indicated on Drawings and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units.
1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
  2. Provide special shapes such as corner brick, etc. for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing and shapes produced by sawing would result in sawed surfaces being exposed to view.
- B. Face Brick: Facing brick complying with ASTM C 216.
1. Basis of Design: Match existing brick and reuse salvaged bricks.
  2. Color: Match existing.
  3. Grade: SW
  4. Type: FBX
  5. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
  6. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced".
  7. Size Match existing.
  8. Bond Pattern: Match existing.
  9. Special Patterns: Where indicated.

2.4 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Colored Cement Product: Packaged blend made from portland cement and hydrated lime masonry cement or mortar cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.
1. Color: Match existing.
- D. Aggregate for Mortar: ASTM C 144.

For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.

1. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

- E. Water: Potable

## 2.5 REINFORCEMENT

- A. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.

1. Coating: Hot-dip galvanized, carbon steel.
2. Wire Size for Side Rods: 0.148-inch diameter.
3. Wire Size for Cross Rods: 0.148-inch diameter.
4. Wire Size for Veneer Ties: 0.148-inch diameter.
5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
6. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

- B. Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

## 2.6 TIES AND ANCHORS

- A. Brick Veneer Anchors, General

1. Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment to backup wall and as follows:
  - a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
  - b. Tie and Anchors: Provide anchoring systems ties that comply with ACI 530.1/ASCE 6.
  - c. Material: ASTM A 167 or ASTM A 240/A 240M sheet metal galvanized to comply with ASTM A 653/A 653M, G60 coating unless indicated otherwise.

- B. Partition Top anchors: 0.105-inch- thick metal plate with 3/8-inch- diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

- C. Substrate Anchors

1. Manufacturers: The basis of design products indicated are from Hohmann & Barnard, Inc. Provide product indicated or a comparable product by one of the following manufacturers:
  - a. Dayton Superior Corporation, Dur-O-Wal Division;
  - b. Heckmann Building Products, Inc.
2. Brick Veneer Adjustable Anchors with Masonry or Concrete Backup Wall:
  - a. Basis of Design Product: "HB-213-2X Adjustable Veneer Anchor" units consisting of a wire tie and a metal anchor section.
3. Brick Veneer Anchor with Masonry Backup Wall:
  - a. Basis of Design: "Hook and Eye Tie System #270-2X" in size as required to comply with required joint embed criteria.
4. Brick Veneer Adjustable Anchors with Stud Wall:
  - a. Basis of Design Product: "HB-213-2X Adjustable Veneer Anchor" units consisting of a wire tie and a metal anchor section.

2.7 EXPANSION JOINTS

- A. General: Install expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form expansion joints with open joint full depth of brick wythe with a 3/8" for installation of sealant and backer rod specified in specification section "Joint Sealants."
- C. Provide horizontal, pressure-relieving joints by either leaving an airspace or inserting a compressible filler of width required for installing sealant and backer rod specified in specifications section "Joint Sealants," but not less than 3/8 inch nor more than 5/8". Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

2.8 ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane, or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- D. Metal Flashing: Copper comply with ASTM B 370, Temper H00, cold-rolled copper sheet, 0.0216 inch thick or ASTM B 370, Temper H01, high-yield copper sheet 0.0162 inch thick. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.
- E. Elastomeric Thermoplastic Flashing: Composite flashing product consisting of a polyester-reinforced ethylene interpolymer alloy.
  - 1. Self-Adhesive Sheet with Drip Edge: Elastomeric thermoplastic flashing, 0.025 inch thick, with a 0.015-inch thick coating of rubberized-asphalt adhesive. Where flashing extends to face of masonry, rubberized-asphalt coating is held back approximately 1-1/2 inches from edge.
- F. Weep/Vents: Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch OD by 4 inches long.

2.9 DRAINAGE MATS

- A. Cavity Drainage Strip Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
  - 1. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. Advanced Building Products Inc.; Mortar Break II.

- b. Dayton Superior Corporation, Dur-O-Wal Division; Polytite MortarStop.
- c. Mortar Net USA, Ltd.; Mortar Net.
- 2. Provide one of the following configuration:
  - a. Strips, not less than 3/4 inch thick and 10 inches high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.

## 2.10 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
- B. Job-Mixed Detergent Solution: Solution of 1/2 cup dry measure tetrasodium polyphosphate and 1/2 cup dry measure laundry detergent dissolved in 1 gallon of water.

## 2.11 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar.
  - 2. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide Type N unless another type is indicated.
- D. Pigmented Mortar: Use colored cement product. Do not add pigments to colored cement products.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION OF DAMPPROOFING

- A. General: Install dampproofing and accessory materials according to manufacturer's written instructions and according to recommendations.



### 3.3 INSTALLATION OF FACE BRICK, GENERAL

- A. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- B. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- C. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
  - 1. Mix units from several pallets or cubes as they are placed.
- D. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

### 3.4 TOLERANCES

- A. Dimensions and Locations of Elements:
  - 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
  - 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
  - 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
- B. Lines and Levels:
  - 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
  - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
  - 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
  - 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
  - 5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
  - 6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
  - 7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.
- C. Joints:
  - 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch; do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.

2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.
3. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

### 3.5 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in bond indicated, unless a special bond pattern is indicated on drawings; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

### 3.6 MORTAR BEDDING AND JOINTING

- A. Lay hollow brick with entire units, including areas under cells, fully bedded in mortar at starting course on footings.
- B. Tool exposed joints.

### 3.7 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers to backup wall with veneer anchors to provide not less than 1 inch of air space or as indicated on drawings and comply with the following requirements:
  1. Concrete Wall Backup: Fasten screw-attached anchors to masonry or concrete with metal fasteners of type indicated where embed tie installation is not possible.
  2. Masonry Wall Backup: Embed tie sections in masonry joints.
  3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  4. Stud Wall Backup: Fasten screw-attached anchors to metal studs with metal fasteners of type indicated.
  5. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally, with not less than 1 anchor for each 2.67 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.
- B. Fasten screw-attached anchors to masonry with metal fasteners of type indicated.
- C. Embed tie sections in masonry joints. Provide not less than 2 inches of air space between back of masonry veneer and face of sheathing.

- D. Locate anchor sections to allow maximum vertical differential movement of ties up and down.

### 3.8 EXPANSION JOINTS

- A. General: Install expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form expansion joints in brick as follows:
  - 1. Build flanges of factory-fabricated, expansion-joint units into masonry.
  - 2. Build in compressible joint fillers where indicated.
  - 3. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod specified in Division 07 Section "Joint Sealants".
- C. Provide horizontal, pressure-relieving joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 07 Section "Joint Sealants", but not less than 3/8 inch.
  - 1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

### 3.9 LINTELS

- A. Install steel lintels where indicated.
- B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

### 3.10 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
  - 1. At Masonry Backup Wall: Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
  - 2. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
  - 3. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal flashing termination.
  - 4. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.

- C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- D. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
  - 1. Use specified weep/vent products to form weep holes.
  - 2. Use wicking material to form weep holes above flashing under brick sills. Turn wicking down at lip of sill to be as inconspicuous as possible.
  - 3. Space weep holes formed from plastic tubing or wicking material 24 inches o.c.
  - 4. Trim wicking material flush with outside face of wall after mortar has set.
- E. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material.
- F. Install vents in head joints in exterior wythes at spacing indicated. Use specified weep/vent products to form vents.
  - 1. Close cavities off vertically and horizontally with blocking in manner indicated. Install through-wall flashing and weep holes above horizontal blocking.

### 3.11 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  - 3. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
  - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  - 5. Clean brick by bucket-and-brush hand-cleaning method described in "BIA Technical Notes 20".
  - 6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

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3.12 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 04 21 13



## SECTION 04 23 00 - REINFORCED UNIT MASONRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes reinforced masonry installation, reinforcement, and forming as required to complete this project. All reinforced masonry installation shall conform to the requirements of this and referenced specifications.
- B. Related Sections:
  - 1. Section 03 30 00 – Cast-In-Place Concrete
  - 2. Section 04 05 00 – Masonry Grout
  - 3. Section 04 20 18 – Unit Masonry Assemblies
- C. The general provisions of the Contract, including General Conditions, Supplementary Conditions, Special Conditions (if any) along with the General Requirements, apply to the work specified in this section.
- D. Examine all Drawings and all other Sections of the Specifications for requirement therein affecting the work of this trade.

#### 1.2 DEFINITIONS

- A. Contractor: General Contractor. Also refers to Construction Manager when this form of construction is utilized on the project.
- B. Sub-contractor: Provides materials or services for the project through the Contractor.

#### 1.3 SUBMITTALS

- A. General:
  - 1. Submit all documents and samples in conformance to Specification Section 01 33 00.
  - 2. Electronic submittals are required. printed copies are acceptable when specifically requested by the Owner or Architect.
  - 3. Review of shop drawings does not constitute authorization to vary from the contract documents.
  - 4. Submittal Scheduling: Contractor shall be responsible for scheduling submittals with ample time allotted for the review process and possible re-submittals.
- B. Mill Certificates: Submit certificates as follows:
  - 1. Certificate of compliance for concrete masonry units, aggregates, cement, and lime.
  - 2. Steel producer's certificates of mill analysis, tensile and bend tests for reinforcement steel required for project.
- C. Fire Resistance Documentation:
  - 1. Submit documents indicating the material composition, equivalent thickness, and hourly fire rating provided by unfilled block units in conformance to the requirements of the Quality Assurance Article of this Specification Section for all concrete masonry to be installed as part of a fire rated assembly.
- D. Mix Design for Grout: At the same time as the Concrete Masonry submittal, submit documents required by Specification Section 04 05 00 – Masonry Grout as a separate submittal number.
- E. Test Reports: Submit reports on all tests required herein.

- F. Shop Drawings for Reinforcing:
1. Submit shop drawings for fabrication, bending, and placement of all reinforcement bars.
    - a. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures".
    - b. Electronic submittal is required and file format utilizing PDF format is preferred.
    - c. Drawings shall be clearly marked "FOR APPROVAL ONLY – NOT FOR FIELD USE". If drawings are not approved but are returned for corrections, the approval copies shall be resubmitted. After initial review has been made, final drawings shall be resubmitted, with all corrections made, for final review, stamped "FOR FIELD USE".
    - d. Verify necessary dimensions at the project site and be responsible for dimensional correctness and accurately fitting work of this Section.
  2. Computer drawing files are available for use in the production of shop drawings. Requirements include disclaimer provided by the Engineer and which is to be accepted and signed by the Contractor as well as the sub-contractor requesting the files.
  3. Show bar schedules, diagrams of bent bars, stirrup spacing, lateral ties and other arrangements and assemblies as required for fabrication and placement of reinforcement for unit masonry work.

#### 1.4 QUALITY ASSURANCE

- A. Reinforced Masonry Standards:
1. All concrete masonry work shall comply with the latest edition of the Specifications for Masonry Structures (ACI 530.1/ASCE 6) except as noted herein.
- B. Concrete Masonry for Fire Rated Construction:
1. All concrete masonry to be installed as part of a fire rated assembly shall have their equivalent thickness calculated based on their material composition and nominal unit width in accordance with the latest edition of ASTM C140.
    - a. The equivalent thickness shall be used to determine the appropriateness of concrete masonry units to be installed for the required hourly fire rating of Project fire assemblies.
  2. The hourly rating provided by an unfilled or non-grouted concrete masonry unit shall be based on the currently enforced edition of the Florida Building Code for all concrete masonry to be installed as part of a fire rated assembly.
    - a. Underwriter's Laboratory (UL) tested and listed CMU assemblies shall only be considered if deemed acceptable by the Code Authority Having Jurisdiction over this Project.
    - b. The Contractor shall notify the Architect, in writing, if concrete masonry intended for fire rated assemblies will not provide the required hourly rating as an unfilled unit and propose remedial course of action for Architect's review and approval.
      - 1) Only remedial action approved by the Architect will be carried out.
- C. General Testing Requirements:
1. Submit all test reports required by this Spec Section within 3 days of completion of the test to permit verification of compliance with the requirements of the Construction Documents.
    - a. These findings shall be reported both electronically and in print to the Architect and Engineer.
    - b. The Contractor shall keep a log of all testing with date of submittal to the Architect and Engineer indicated for each entry.
- D. Grout Testing: Refer to Specification Section 04 05 00 – Masonry Grout.



- E. Mortar Testing: Refer to Specification Section 04 20 00 – Unit Masonry.
- F. Contractor shall employ and pay an independent testing laboratory, acceptable to the Architect and Engineer, to provide the following tests:
  - 1. Lab Qualifications: Testing laboratory shall meet the requirements of ASTM E329.
  - 2. Concrete Masonry Unit Tests (Preconstruction):
    - a. Prior to any construction, verify by laboratory tests in accordance with ASTM C140 that the concrete masonry units to be used on this project comply with the project requirements.
      - 1) Tests for the following information: compressive strength, absorption, unit weight (density), moisture content, and dimensions.
      - 2) Test 6 units minimum for the first lot of 10,000 units scheduled for the project and 6 additional units for every 50,000 units thereafter which are scheduled for the project.
  - 3. Concrete Masonry Unit Tests (During Construction):
    - a. During construction, verify by laboratory tests in accordance with ASTM C 140 that the concrete masonry units being used on the project comply with the project requirements and reflect similar results to the preconstruction tests.
    - b. Test 6 units for every 10,000 square feet of each type of masonry constructed.
- G. Perform work in accordance with State of Florida, Florida Building Code, and Florida Department of Education's S.R.E.F.

## 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40°F.
- B. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100°F or ambient temperature is greater than 90°F with wind velocity greater than 8 mph (13 km/h).

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Concrete Masonry Units (CMU):
  - 1. General:
    - a. Refer to Section 04 20 00 - Unit Masonry for masonry materials and accessories not included in this section.
    - b. Aggregate: All aggregate shall consist of clean, hard, uncoated grains, uniform in color, free from dust, soft or flaky particles, shale, alkali, organic matter, loam, or other deleterious substances.
  - 2. Smooth Face Units:
    - a. Unless required otherwise by the Architect, Grade N-II normal, blended or lightweight units conforming to ASTM C 90 and, in addition, to the requirements of the Quality Control Standards of the National Concrete Masonry Association.
    - b. The units shall have a minimum compressive strength of 2000 psi on the net cross-sectional area.
    - c. Units shall have cured for not less than 28 days when placed in the structure.
    - d. Units shall be of cellular construction, with the cells vertical and an exposed face of 7-5/8" high x 15-5/8" long (8" x 16" nominal sized) x the (nominal) thicknesses indicated on the Drawings.
- B. Reinforcement:
  - 1. Deformed Reinforcement Bars: Provide deformed bars of following grades complying with

- ASTM A615, except as otherwise indicated.
- a. Provide Grade 60 for bars No. 3 to No. 18, except as otherwise indicated.
  - b. Where No. 2 bars are shown, provide plain, round, carbon steel bars, ASTM A675. Grade 80.
  - c. Shop-fabricate reinforcement bars which are shown to be bent or hooked.
2. Welded Wire Reinforcement: Provide wire reinforcement conforming to ASTM A82.
- a. For joint reinforcement in concrete masonry, provide welded wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units.
  - b. Width shall be approximately 2" less than the nominal width of walls as required to provide mortar coverage of not less than 5/8" on joint faces exposed to the exterior and 1/2" elsewhere.
  - c. Wire size for side rods shall be 0.1875" diameter.
    - 1) Optionally, the Contractor may submit #8 side rods for installation at 8" o.c.
  - d. Wire size for cross-rods shall be #8.
  - e. Joint reinforcement shall be of a ladder design.
    - 1) Joint reinforcement for exterior wall construction shall be hot dipped galvanized after fabrication in accordance with ASTM A153, Class B-2.
    - 2) Joint reinforcement for interior wall construction shall be mill galvanized in accordance with ASTM A641, Class I.
  - f. Provide and install prefabricated "L" and "T" of the same construction as the main units to provide continuity at corners and intersections.

## PART 3 - EXECUTION

### 3.1 INSTALLATION – GENERAL

- A. Refer to Section 04 20 00 - Unit Masonry for general installation requirements of unit masonry
- B. All masonry shall be laid true, level, plumb and neat, reflecting the highest quality of workmanship. Masonry units shall be sound, dry, clean, and free from cracks when placed. Wetting of concrete masonry units shall not be permitted.
- C. Proper masonry units shall be used to minimize cutting of units. Where cutting is necessary, all cuts shall be neat and true, and shall be cut using motor-driven saws. Provide the necessary materials to cover and to protect the masonry units and the walls from weather and other dangers during the progress of the work.
- D. Use special shaped units where shown, and as required for corners, jambs, sashes, control joints, lintels, bond beams and other special conditions.
  1. Where shaped units are part of a decorative CMU assembly, use shaped unit of the same character and appearance.
- E. The top surface of the concrete foundation shall be clean, all laitance removed, and aggregate exposed before starting the masonry construction.
- F. Use continuous dovetail anchors between masonry units and cast-in-place concrete members.
- G. Coordinate placement of all built-in work, bearing plates, and anchors supplied by other sections.
- H. Temporary Formwork: Provide formwork and shores as required for temporary support of reinforced masonry elements.
  1. Construct formwork to conform to shape, line and dimensions shown. Make sufficiently tight to prevent leakage of mortar, grout, or concrete (if any). Brace, tie, and support as required in order to maintain position and shape during construction and curing of reinforced masonry.

- I. Isolate masonry partitions from vertical structural framing members with movement joint as indicated on drawings.
- J. Isolate top of masonry from horizontal structural framing members and slabs or decks as detailed on the drawings.

### 3.2 REINFORCEMENT

- A. General:
  - 1. Clean reinforcement of loose rust, mill scale, concrete, earth, ice or other materials which will reduce bond to mortar or grout.
  - 2. Reinforcing bars shall be straight except for bends around corners and where bends or hooks are indicated on the Drawings or approved shop drawings.
    - a. Do not use reinforcement bars with kinks or bends not shown on Drawings or final shop drawings, or bars with reduced cross-section due to excessive rusting or other causes.
    - b. Foundation dowels shall not slope more than 1:6 (H:V), and shall be grouted into a core in vertical alignment.
- B. Position reinforcement accurately at the spacing indicated.
  - 1. Support and secure vertical bars against displacement.
    - a. Vertical bars shall be held in position at the top and bottom and at intervals not exceeding 192 bar diameters.
  - 2. Keep reinforcing bars clear of adjacent components.
    - a. Vertical bars shall have a minimum clearance of 1/4" from the masonry.
    - b. Where vertical bars are shown in close proximity, provide a clear distance between bars of not less than the nominal bar diameter or 1", whichever is greater.
    - c. For columns, piers and pilasters, provide a clear distance between vertical bars as indicated, but not less than 1-1/2 times the nominal bar diameter or 1-1/2", whichever is greater. Provide lateral ties as indicated.
  - 3. Horizontal reinforcement shall be placed as the masonry work progresses.
    - a. Horizontal bars shall be laid on the webs of the units in continuous masonry courses, consisting of bond beam or channel units, and shall be solidly grouted in place.
- C. Extend reinforcement beyond top of masonry lift as required for splicing. Pour grout to within 1-1/2" of top course of first pour. After grouted masonry is cured, lay masonry units and place reinforcement for second pour section before grouting. Repeat sequences if more pours are required.
- D. Splice reinforcement bars where shown; do not splice at other points unless acceptable to the Engineer. Provide lapped splices, unless otherwise indicated. In splicing vertical bars or with dowels, lap ends, place in contact and wire-tie together. Lap bars side by side in plane of wall to maintain proper clearances.
  - 1. Provide not less than minimum lap shown, or if not indicated, as required by governing code or 48 times the bar diameter, whichever is greater.
- E. Embed metal ties in mortar joints as work progresses, with a minimum mortar cover of 5/8" on exterior face of walls and 1/2" at other locations.
- F. Horizontal Joint Reinforcement:
  - 1. Unless otherwise indicated, provide horizontal joint reinforcement in every other horizontal joint for 3/16" side rod reinforcing, or on every joint for #8 side rod reinforcing.
  - 2. Embed prefabricated horizontal joint reinforcement as the work progresses, with a minimum cover of 5/8" on exterior face of walls and 1/2" at other locations.

3. Wire reinforcement shall be lapped at least 6" at splices and shall contain at least one cross-wire of each piece of reinforcement in the lap distance.
4. Install prefabricated "L" and "T" at their respective corner and intersection conditions.
  - a. Cut and bend units only as recommended by manufacturer for continuity at returns, offsets, pipe enclosures and other special conditions.
  - b. Field cut and shaped corner "L's" and intersection "T's" are strictly prohibited.

G. Lateral Tie Reinforcement:

1. Embed lateral tie reinforcement in mortar joints where indicated. Place reinforcement at vertical spacing shown as masonry units are laid.
2. Where lateral ties are shown in contact with vertical reinforcement bars, embed additional lateral tie reinforcement in mortar joints. Place as shown, or if not shown, provide as required to prevent grout blowout or rupture of CMU face shells, but provide not less than No. 2 bars or 8-gage wire ties spaced 16" o.c. for members with 20" or less side dimensions, and 8" o.c. for members with side dimensions exceeding 20".

### 3.3 INSTALLATION OF REINFORCED CONCRETE UNIT MASONRY

A. General:

1. Do not wet concrete masonry units (CMU) except for saw cutting per OSHA requirements.
2. Lay CMU units with full-face shell mortar beds. Fill vertical head joints (end joints between units) solidly with mortar from face of unit to a distance behind face equal to not less than the thickness of longitudinal face shells. Solidly bed cross-webs in mortar in starting courses and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be reinforced and filled with grout. Maintain head and bed joint widths shown, or if not shown, provide 3/8" joints.
  - a. Where solid CMU units are shown, lay with full mortar head and bed joints.

B. Walls:

1. Pattern Bond: Lay CMU wall units in a 1/2-running bond with vertical joints in each course centered on units in courses above and below, unless otherwise indicated.
2. Bond and interlock each course at corners and intersections. Reinforce and solid-grout all cells at corners and intersections.
  - a. Corners shall have a standard masonry bond by overlapping units.
  - b. Intersecting masonry walls without control joints shall be interlocked by 50% overlap.
3. All masonry below grade shall be solid-grouted.
4. Maintain vertical continuity of core or cell cavities, which are to be reinforced and grouted, to provide minimum clear dimensions indicated and to provide minimum clearance and grout coverage for vertical reinforcement bars. Keep cavities free of mortar. Solidly bed webs in mortar where adjacent to reinforced cores or cells.
5. Place horizontal beam reinforcement as the masonry units are laid.
6. Where horizontal reinforced beams (bond beams) are shown, use special units or modify regular units to allow for placement of continuous horizontal reinforcement bars. Place small mesh expanded metal lath or wire screening in mortar joints under bond beam courses over cores or cells of non-reinforced vertical cells, or provide units with solid bottoms (unless shown otherwise). Do not use building paper or sheet plastic to close voids due to breakage of mortar bond.
  - a. Option: Where all vertical cores are not shown to be grouted. Contractor may elect to fill all vertical cores with grout provided that the area is not supported by beams but is continuous to the foundation.

C. Columns, Piers and Pilasters:

1. Use CMU units of the size, shape and number of vertical core spaces shown. If not shown, use units which provide minimum clearances and grout coverage for the number and size of vertical reinforcement bars shown.
2. Provide pattern bond shown, or if not shown, alternate head joints in vertical alignment.
3. Where bonded pilaster construction is shown, lay wall and pilaster units together to maximum pour height specified.

### 3.4 MORTAR

- A. All mortar used for concrete masonry shall conform to the requirements of Specification Section 04 20 00 – Unit Masonry.
- B. Mix mortar in a power-driven batch mixer of one bag minimum capacity for at least three minutes after all materials have been added.
- C. Hand mixing will not be allowed. Use mortar within two hours after mixing; discard mortar not used within this time limit. Re-tempering will be allowed to restore the required consistency as needed until the two hour limit is reached.
- D. Mortar joints shall be 3/8" thick with full mortar coverage on the face shells and webs surrounding the cells to be filled.
  1. Interior Joints shall be:
    - a. Tooled at faces to be painted.
    - b. Flush at faces to received drywall, hardcoat or ceramic tile.
  2. Exterior Joints shall be:
    - a. Tooled at faces to be exposed.
    - b. Flush at faces to receive brick, ceramic tile or other veneer.
  3. Joints of 8" wide units shall be laid with the interior faces true.
  4. Joints of 4" wide units (to receive stucco) shall be laid with exterior faces true.
- E. The starting joint on foundations shall be laid with full mortar coverage on the bed joint except that the area where grout occurs shall be free from mortar so that the grout will contact the foundation.

### 3.5 GROUTING

- A. General:
  1. Refer to Section 04 05 00 – Masonry Grout.
  2. Use "Fine Grout" per ASTM C476 for filling spaces less than 3" in one or both horizontal directions.
  3. Use "Course Grout" per ASTM C476 for filling 3" spaces or larger in both horizontal directions.
  4. Place grout by pumping into grout spaces unless alternate methods are acceptable to the Architect and Engineer.
  5. Rod or Vibrate each grout lift during pouring operation, and again after excess moisture has been absorbed, but before plasticity is lost.
  6. Limit grout pours to sections which can be completed in one working day with not more than one hour interruption of pouring operation.
  7. Place grout in lintels or beams over openings in one continuous pour.
  8. Where bond beams occur more than one course below top of pour, fill bond beam during construction of masonry.
- B. Preparation of Grout Spaces:
  1. Prior to grouting, inspect and clean grout spaces. Remove dust, dirt, mortar droppings, loose pieces of masonry and other foreign materials from grout spaces. Clean reinforcing and adjust to proper position. Clean top surface of structural members supporting masonry to ensure bond.

2. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist displacement of masonry units and breaking of mortar bond, 3 days minimum. Install shores and bracing, if required, before starting grouting operations.
  3. High-Lift Grouting: After final cleaning and inspection, close cleanout holes and brace closures to resist grout pressures.
- C. Grouting Technique: Use grouting techniques subject to requirements which follow.
1. High-Lift Grouting:
    - a. Do not use high-lift grouting technique for grouting of CMU unless minimum cavity dimension is 3" and area is 12 sq. in.
    - b. Provide cleanout holes in first course at all vertical cells which are to be filled with grout.
      - 1) Use units with one face shell removed and provide temporary supports for units above, or use header units with concrete brick supports, or cut openings in one face shell (preferred alternate). Minimum cleanout size shall be 3"x 4". Locate cleanouts in areas not exposed to view in finished structure.
    - c. Construct masonry to full height of maximum grout pour specified, prior to placing grout.
      - 1) Limit grout lifts to a maximum height of 4' -8" and grout pour to a maximum height 24', for single wythe hollow concrete masonry walls, unless otherwise indicated.
    - d. Place vertical reinforcement before grouting. Place before or after laying masonry units, as required by job conditions. The vertical reinforcement to dowels at base of masonry where shown and thread CMU over or around reinforcement. Support vertical reinforcement at intervals not exceeding 192 bar diameters nor 10 feet.
      - 1) Where individual bars are placed after laying masonry, place wire loops extending into cells as masonry is laid and loosen before mortar sets. After insertion of reinforcement bar, pull loops and bar to proper position and tie free ends.
      - 2) Where reinforcement is prefabricated into caged units before placing, fabricate units with vertical reinforcement bars and lateral ties of the size and spacing indicated.
    - e. Allow not less than 30 minutes, nor more than one hour between lifts of a given pour.
    - f. Rod or Vibrate each grout lift during pouring operation, and again after excess moisture has been absorbed, but before plasticity is lost.
    - g. Do not penetrate or damage grout placed in previous lifts or pours.
  2. Low-Lift Grouting:
    - a. Construct masonry to height of maximum grout lift specified, prior to placing grout.
      - 1) Limit grout lifts to a maximum height of 4' - 8", unless otherwise indicated.
    - b. Clean debris and mortar droppings out of cells prior to installing reinforcing.
    - c. Place vertical reinforcement before grouting. Tie vertical reinforcement to dowels at base of masonry where shown and thread CMU over or around reinforcement. Support vertical reinforcement at intervals not exceeding 4' - 8" in one grout lift.
    - d. Rod or Vibrate each grout lift during pouring operation, and again after excess moisture has been absorbed, but before plasticity is lost.
  3. Place horizontal beam reinforcement as the masonry units are laid.
  4. Embed lateral tie reinforcement in mortar joints where indicated. Place reinforcement at vertical spacing shown as masonry units are laid.
    - a. Where lateral ties are shown in contact with vertical reinforcement bars, embed additional lateral tie reinforcement in mortar joints. Place as shown, or if not shown, provide as required to prevent grout blowout or rupture of CMU face shells, but provide not less than No. 2 bars or 8-gage wire ties spaced 16" o.c. for members with 20" or less side dimensions, and 8" o.c. for members with side dimensions exceeding 20".
  5. Preparation of Grout Spaces: Prior to grouting, inspect and clean grout spaces. Remove

dust, dirt, mortar droppings, loose pieces of masonry and other foreign materials from grout spaces. Clean reinforcing and adjust to proper position. Clean top surface of structural members supporting masonry to ensure bond.

- a. High-Lift Grouting: After final cleaning and inspection, close cleanout holes and brace closures to resist grout pressures.
6. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist displacement of masonry units and breaking of mortar bond, 3 days minimum. Install shores and bracing, if required, before starting grouting operations.
7. Place grout by pumping into grout spaces unless alternate methods are acceptable to the Architect and Engineer.
8. Limit grout pours to sections which can be completed in one working day with not more than one hour interruption of pouring operation. Place grout in lifts which do not exceed 4'-8". Place grout in lintels or beams over openings in one continuous pour.
  - a. High-Lift Grouting: Allow not less than 30 minutes, nor more than one hour between lifts of a given pour. Rod or Vibrate each grout lift during pouring operation, and again after excess moisture has been absorbed, but before plasticity is lost. Do not penetrate or damage grout placed in previous lifts or pours.
  - b. Low-Lifting Grouting: Rod or Vibrate each grout lift during pouring operation, and again after excess moisture has been absorbed, but before plasticity is lost.
9. Where bond beams occur more than one course below top of pour, fill bond beam during construction of masonry

### 3.6 POINTING

- A. Point-up all joints at corners, openings and adjacent work to provide a neat, uniform appearance, properly prepared for application of caulking or sealant compounds.

### 3.7 TOLERANCES

- A. Maximum Variation from Plumb:  $\frac{1}{4}$ " per story non-cumulative;  $\frac{1}{2}$ " in two stories or more.
- B. Maximum Variation from Level Coursing:  $\frac{1}{8}$ " in 5' and  $\frac{1}{4}$ " in 10';  $\frac{1}{2}$ " in 30'

### 3.8 CONTROL AND EXPANSION JOINTS

- A. Locate all CMU control and expansion joints per the Drawings.
- B. Do not continue horizontal joint reinforcement through control and expansion joints.
- C. Install preformed control joint device in continuous lengths as shown in the Drawings.
  1. Seal butt and corner joints.
  2. Size control joint in accordance with Section 07 92 00, JOINT SEALANTS for sealant performance.

### 3.9 BUILT-IN WORK

- A. As work progresses, install all built-in components, bearing plates, and anchors furnished by other sections.
- B. Electrical boxes and any other items that are built into exposed masonry shall be flush with face of wall.
  1. Maximum recess for any built in item is  $\frac{1}{8}$ ".
  2. No protrusion from face of wall shall be allowed.
  3. Maximum clearance between masonry and built in item shall be  $\frac{1}{4}$ ".

### 3.10 REPAIR AND REMEDIATION

- A. In the event of damage, immediately make all repairs and replacement necessary to the approval of the Architect and at no additional cost to the Owner.
  - 1. Remove and replace masonry units which are loose, chipped, broken, stained, or otherwise damaged, or if units do not match adjoining units as intended.
  - 2. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement. During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar.
  
- B. Any concrete masonry construct that the Architect or Engineer deems to be in non-conformance to the requirements of this and all related Specification Sections shall be subject to demolition and reconstruction in conformance to the Specifications to the extent defined Architect or Engineer.
  - 1. Any and all remedial work to resolve any non-conformance or deficiency will be wholly at Contractor's expense.

### 3.11 CLEANING AND PROTECTION

- A. Concrete scum and grout stains shall be removed immediately. After the concrete masonry assembly is constructed, it shall not be saturated with water for curing or any other purpose.

### 3.12 MOISTURE AND AIR BARRIERS

- A. Prior to applying any moisture and/or air barrier on concrete masonry, fill all voids, pits and depressions greater than 1/8" deep measured from the CMU face surface with Spec compliant mortar. In addition, remove any debris, unused form fasteners, or excess mortar and patch as required.
  - 1. Resultant surface shall be continuous, smooth, and free of debris to permit undisturbed sheeting of moisture over the subsequently installed moisture membrane.
  - 2. Mortar shall not be used as a filling material after the moisture/air membrane is installed.
  
- B. See Division 7 for moisture and air membrane materials and installation requirements.

END OF SECTION 04 23 00



## SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

### 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. Structural steel.
2. Prefabricated building columns.
3. Field-installed shear connectors.
4. Grout.

B. Related Requirements:

1. Section 05 31 00 "Steel Decking" for field installation of shear connectors through deck.
2. Section 05 50 00 "Metal Fabrications" for miscellaneous steel fabrications and other steel items not defined as structural steel.
3. Sections 09 91 13 "Exterior Painting" and 09 91 23 "Interior Painting" for surface-preparation and priming requirements.

#### 1.3 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303 "Code of Standard Practice for Steel Buildings and Bridges."

#### 1.4 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

#### 1.5 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

#### 1.6 ACTION SUBMITTALS

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

- B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and

- supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pre-tensioned and slip-critical, high-strength bolted connections.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint, including the following:
1. Power source (constant current or constant voltage).
  2. Electrode manufacturer and trade name, for demand critical welds.
- D. Delegated-Design Submittal: For structural-steel connections indicated to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, fabricator and testing agency.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural steel, including chemical and physical properties.
- E. Product Test Reports: For the following:
1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  2. Direct-tension indicators.
  3. Tension-control, high-strength, bolt-nut-washer assemblies.
  4. Shear stud connectors.
  5. Shop primers.
  6. Non-shrink grout.
- F. Survey of existing conditions.
- G. Source quality-control reports.
- H. Field quality-control and special inspection reports.

#### 1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- D. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 341 and AISC 341s1.
3. AISC 360.
4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
  2. Clean and re-lubricate bolts and nuts that become dry or rusty before use.
  3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

## PART 2 – PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated.

### 2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M, Grade 50 (345).
- B. Channels, Angles, S-Shapes: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.
- E. Steel Pipe: ASTM A 53/A 53M, Type E or Type S, Grade B.
1. Weight Class: As indicated.
  2. Finish: Black except where indicated to be galvanized.
- F. Steel Castings: ASTM A 216/A 216M, Grade WCB with supplementary requirement S11.
- G. Steel Forgings: ASTM A 668/A 668M.
- H. Welding Electrodes: Comply with AWS requirements.

### 2.3 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.

- B. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- C. Un-headed Anchor Rods: ASTM F 1554, Grade 36.
  - 1. Configuration: Straight.
  - 2. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
  - 3. Plate Washers: ASTM A 36/A 36M carbon steel.
  - 4. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
  - 5. Finish: As indicated.
- D. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.
  - 1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
  - 2. Plate Washers: ASTM A 36/A 36M carbon steel.
  - 3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
  - 4. Finish: As Indicated.
- E. Threaded Rods: ASTM A 36/A 36M.
  - 1. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
  - 2. Washers: ASTM A 36/A 36M carbon steel.
  - 3. Finish: As Indicated.
- F. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.
- G. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.
- H. Structural Slide Bearings: Low-friction assemblies, of configuration indicated, that provide vertical transfer of loads and allow horizontal movement perpendicular to plane of expansion joint while resisting movement within plane of expansion joint.
  - 1. Mating Surfaces: PTFE and PTFE.
  - 2. Coefficient of Friction: Not more than 0.06.
  - 3. Design Load: Not less than 2,000 psi (13.7 MPa).
  - 4. Total Movement Capability: 2" (50 mm).

## 2.4 PRIMER

- A. Primer: Comply with Sections 09 91 13 "Exterior Painting" and 09 91 23 "Interior Painting".
- B. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- C. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

## 2.5 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.6 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.
  - 1. Camber structural-steel members where indicated.
  - 2. Fabricate beams with rolling camber up.
  - 3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings

- until structural steel has been erected.
  - 4. Mark and match-mark materials for field assembly.
  - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
- 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."
- F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
- 1. Cut, drill, or punch holes perpendicular to steel surfaces.
  - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
  - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

## 2.7 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
- 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
- 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

## 2.8 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
- 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2" (50 mm).
  - 2. Surfaces to be field welded.
  - 3. Surfaces of high-strength bolted, slip-critical connections.
  - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
  - 5. Galvanized surfaces.
  - 6. Surfaces enclosed in interior construction.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
- 1. SSPC-SP 2, "Hand Tool Cleaning."
  - 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written

instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

## 2.9 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
  - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.

## 2.10 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform shop tests and inspections.
  - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Bolted Connections: Inspect shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
  - 1. Liquid Penetrant Inspection: ASTM E 165.
  - 2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
  - 3. Ultrasonic Inspection: ASTM E 164.
  - 4. Radiographic Inspection: ASTM E 94.
- D. In addition to visual inspection, test and inspect shop-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
  - 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  - 2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.
- E. Prepare test and inspection reports.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
  - 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

### 3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Baseplates Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

### 3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  - 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  - 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," for mill material.

### 3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
  - 1. Verify structural-steel materials and inspect steel frame joint details.

2. Verify weld materials and inspect welds.
  3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- C. Bolted Connections: Inspect bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
    - a. Liquid Penetrant Inspection: ASTM E 165.
    - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
    - c. Ultrasonic Inspection: ASTM E 164.
    - d. Radiographic Inspection: ASTM E 94.
- E. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  2. Conduct tests according to requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors already tested.

### 3.6 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Touchup Painting: Cleaning and touchup painting are specified in Sections 09 91 13 "Exterior Painting" and 09 91 23 "Interior Painting".

END OF SECTION 05 12 00



## SECTION 05 21 00 - STEEL JOIST FRAMING

### 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. K-series steel joists.
2. KCS-type K-series steel joists.
3. K-series steel joist substitutes.
4. CJ-series composite steel joists.
5. Joist accessories.

B. Related Requirements:

1. Section 03 30 00 "Cast-in-Place Concrete" for installing bearing plates in concrete.
2. Section 04 20 00 "Unit Masonry" for installing bearing plates in unit masonry.
3. Section 05 12 00 "Structural Steel Framing" for field-welded shear connectors.

#### 1.3 DEFINITIONS

- A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."
- B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support non-uniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of joist, accessory, and product.

B. Shop Drawings:

1. Include layout, designation, number, type, location, and spacing of joists.
2. Include joining and anchorage details; bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Welding certificates.
- C. Manufacturer certificates.
- D. Mill Certificates: For each type of bolt.

- E. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.
- F. Field quality-control reports.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications."
  - 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists as recommended in SJI's "Specifications."
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

#### 1.8 SEQUENCING

- A. Deliver steel bearing plates to be built into cast-in-place concrete and masonry construction.

### PART 2 – PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.
  - 1. Use ASD; data are given at service-load level.
  - 2. Design special joists to withstand design loads with live-load deflections no greater than the following:
    - a. Floor Joists: Vertical deflection of 1/360 of the span.
    - b. Roof Joists: Vertical deflection of 1/240 of the span.

#### 2.2 K-SERIES STEEL JOISTS

- A. Manufacture steel joists of type indicated according to "Standard Specification for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
  - 1. Joist Type: K-series steel joists and KCS-type K-series steel joists.
- B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.
- C. Provide holes in chord members for connecting and securing other construction to joists.
- D. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."

- E. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."
- F. Camber joists according to SJI's "Specifications."
- G. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds  $\frac{1}{4}$ " per 12" (1:48).

## 2.3 PRIMERS

- A. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

## 2.4 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
- B. Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.
- C. Fabricate steel bearing plates from ASTM A 36/A 36M steel with integral anchorages of sizes and thicknesses indicated.
- D. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within  $\frac{1}{2}$ " (13 mm) of finished wall surface unless otherwise indicated.
  - 1. Finish: Plain, uncoated.
- E. Welding Electrodes: Comply with AWS standards.
- F. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

## 2.5 CLEANING AND SHOP PAINTING

- A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.
- C. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written instructions, and requirements in this Section.
  - 1. Before installation, splice joists delivered to Project site in more than one piece.
  - 2. Space, adjust, and align joists accurately in location before permanently fastening.
  - 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
  - 4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads are applied.
- C. Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
- E. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Visually inspect field welds according to AWS D1.1/D1.1M.
  - 1. In addition to visual inspection, test field welds according to AWS D1.1/D1.1M and the following procedures, at testing agency's option:
    - a. Liquid Penetrant Inspection: ASTM E 165/E 165M.
    - b. Magnetic Particle Inspection: ASTM E 709.
    - c. Ultrasonic Testing: ASTM E 164.
    - d. Radiographic Testing: ASTM E 94.
- C. Visually inspect bolted connections.
- D. Prepare test and inspection reports.

### 3.4 PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Touchup Painting: After installation, promptly clean, prepare, and prime or re-prime field connections, rust spots, and abraded surfaces of prime-painted joists, and accessories.
  - 1. Clean and prepare surfaces by hand-tool cleaning according to SSPC-SP 2 or power-tool cleaning according to SSPC-SP 3.
  - 2. Apply a compatible primer of same type as primer used on adjacent surfaces.

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END OF SECTION 05 21 00



## SECTION 05 31 00 - STEEL DECKING

### 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. Roof deck.
- B. Related Requirements:
  - 1. Section 05 50 00 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
  - 2. Sections 09 91 13 "Exterior Painting" and 09 91 23 "Interior Painting" for repair painting of primed deck and finish painting of deck.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings:
  - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product Certificates: For each type of steel deck.
- C. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
  - 1. Power-actuated mechanical fasteners.
  - 2. Acoustical roof deck.
- D. Evaluation Reports: For steel deck, from ICC-ES.
- E. Field quality-control reports.

#### 1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- C. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

### 2.2 ROOF DECK

- A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
  - 1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), G90 (Z275) zinc coating.
  - 2. Deck Profile: Type WR, wide rib. Minimum of 0.5% venting at Cellular Light-Weight Insulating Fill.
  - 3. Profile Depth: 1-1/2" (38 mm).
  - 4. Design Uncoated-Steel Thickness: As indicated on structural drawings.
  - 5. Span Condition: Triple span or more.
  - 6. Side Laps: Overlapped or interlocking seam at Contractor's option.

### 2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 31 for overhang and slab depth.



- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- H. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch (1.52 mm) thick, with factory-punched hole of 3/8-inch (9.5-mm) minimum diameter.
- I. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field.
- J. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck, with 3" (76-mm-) wide flanges and recessed pans of 1-1/2" (38-mm) minimum depth. For drains, cut holes in the field.
- K. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94% zinc dust by weight.
- L. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

### 3.3 ROOF-DECK INSTALLATION

- A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface

diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2" (38 mm) long, and as follows:

1. Weld Diameter: 5/8 inch (16 mm), nominal.
  2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds 12" (305 mm) apart in the field of roof and 6" (150 mm) apart in roof corners and perimeter, based on roof-area definitions in FMG Loss Prevention Data Sheet 1-28 and as indicated.
  3. Weld Washers: Install weld washers at each weld location.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 18" (457 mm), as indicated on plans, and as follows:
1. Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.
  2. Mechanically clinch or button punch.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2" (38 mm), with end joints as follows:
1. End Joints: Lapped 2 inches (51 mm) minimum.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches (305 mm) apart with at least one fastener at each corner.
1. Install reinforcing channels or zees in ribs to span between supports and weld or mechanically fasten.
- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Field welds will be subject to inspection.
- C. Prepare test and inspection reports.

### 3.5 PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.
  1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
  2. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in Sections 09 91 13 "Exterior Painting" and 09 91 23 "Interior Painting".

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- C. Repair Painting: Wire brushing, cleaning, and repair painting of rust spots, welds, and abraded areas of both deck surfaces are included in Sections 09 91 13 "Exterior Painting" and 09 91 23 "Interior Painting".

END OF SECTION 05 31 00



## SECTION 05 50 00 – METAL FABRICATIONS

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to the following metal fabrications:
  - a. Miscellaneous metal fabrications.
  - b. Rough hardware.
  - c. Loose bearing and leveling plates.
  - d. Miscellaneous framing and supports.
  - e. Steel pipe bollards.
  - f. Countertop support.
  - g. Abrasive nosings.
  - h. Miscellaneous framing and supports.
    - 1) Ceiling mounted toilet partitions.

#### 1.3 REFERENCES

- A. AAMA 2603 – Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- B. AAMA 204 – Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- C. AAMA 606.1 – Voluntary Guide Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum.
- D. AAMA 607.1 – Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
- E. AAMA 608.1 – Voluntary Guide Specifications and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum.
- F. ASTM A36/A36M – Standard Specification for Carbon Structural Steel.
- G. ASTM A48/A48M – Standard Specification for Gray Iron Castings.
- H. ASTM A53/A53M – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-coated Welded and Seamless.
- I. ASTM A123/A123M – Standard Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products.
- J. ASTM A153/A153M – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- K. ASTM A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

- L. ASTM A276/A276M – Standard Specification for Stainless Steel Bars and Shapes.
- M. ASTM A283 – Carbon Steel Plates, Shapes, and Bars.
- N. ASTM A307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- O. ASTM A385 – Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
- P. ASTM A500/A500M – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- Q. ASTM A501 – Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- R. ASTM A513/A513M – Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
- S. ASTM A554 – Standard Specification for Welded Stainless Steel Mechanical Tubing.
- T. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- U. ASTM A666- Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- V. ASTM A743/A743M – Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.
- W. ASTM A793 – Standard Specification for Rolled Floor Plate, Stainless Steel.
- X. ASTM A1008/A1008M – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- Y. ASTM B26 – Standard Specification for Aluminum-Alloy Sand Castings.
- Z. ASTM B85 – Standard Specification for Aluminum-Alloy Die Castings.
- AA. ASTM B177 – Standard Guide for Engineering Chromium Electroplating.
- BB. ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- CC. ASTM B210 – Standard Specification for Aluminum-Alloy Drawn Seamless Tubes.
- DD. ASTM B211 – Standard Specification for Aluminum-Alloy Bar, Rod and Wire.
- EE. ASTM B221/B221M – Standard Specification for Aluminum-and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- FF. ASTM B308/B308M – Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
- GG. ASTM B429/B429M – Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
- HH. ASTM B633 – Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
- II. ASTM C1011/C1011M – Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- JJ. ASTM F312/A312M – Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
- KK. ASTM F593 – Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
- LL. ASTM F1941 – Standard Specification for Electrodeposited Coatings on Mechanical Fasteners, Inch and Metric.
- MM. AWS – Standard Symbols for Welding, Brazing, Nondestructive Examination.
- NN. AWS – Structural Welding Code.
- OO. SSPC – Steel Structure Painting Council - Steel Structures Painting Council.
- PP. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product data for products.

- B. Shop drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.
- C. Samples representative of materials and finished products as may be requested by Architect.
- D. Delegated-Design Submittal: Submit design calculations for load bearing elements, analysis data and shop drawings indicating compliance with dedicated design requirements signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.
- E. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- F. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATION SUBMITTALS

- A. Welder current certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.
- B. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include a list of completed projects with project name, addresses, names of architects and owners, and other information specified.

## 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm experienced in producing metal fabrications similar to those indicated for this Project with a record of successful in-service performance, and with sufficient production capacity to produce required units without delaying the Work.
- B. Welding Standards: Comply with applicable provisions of AWS "Structural Welding Code"
  - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.
- C. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for installation of miscellaneous metal work. Provide setting drawings, templates, instructions, and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.
- D. Shop Assembly: Pre-assemble 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 re-assembly and coordinated installation.

## 1.7 FIELD CONDITIONS

- A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating products without field measurements. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

## 1.8 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

## 1.9 PERFORMANCE

- A. Delegated-Design: For items subject to loads required by applicable codes and indicated to comply with performance requirements, design criteria, design shall be performed and include analysis data signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.

## PART 2 – PRODUCTS

### 2.1 METALS, GENERAL



- A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

## 2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- C. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- D. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.
- E. Zinc-Coated Steel Wire Rope: ASTM A 741.
- F. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
  - 1. Size of Channels: 1-5/8 by 1-5/8 inches and as indicated on drawings.
- G. Material: Galvanized steel, ASTM A 653/A 653M.
- H. Material: Cold-rolled steel, ASTM A 1008/A 1008M.
- I. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

## 2.3 STAINLESS STEEL

- A. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304 or Type 316L.
- B. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304 or Type 316L.
- C. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- D. Rolled-Stainless-Steel Floor Plate: ASTM A 793.

## 2.4 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
- B. Aluminum Plate and Sheet: ASTM B 209 (ASTM B 209M), Alloy 6061-T6.
- C. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.

- D. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
- E. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.
- F. Extruded Structural Pipe Round Tubing: ASTM B 429/B 429M, Alloy 6063-T6. Provide Standard Weight (Schedule 40) pipe, unless otherwise indicated.
- G. Drawn Seamless Tubing: ASTM B 210, Alloy 6063-T832.
- H. Die and Hand Forgings: ASTM B 247, Alloy 6061-T6.

## 2.5 ACCESSORIES

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for the metal alloy to be welded.
- B. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A47, or cast steel, ASTM A27. Provide bolts, washers, and shims as required, hot-dip galvanized, ASTM A153.

## 2.6 PAINT

- A. Shop Primer for Ferrous Metal:
  - 1. Exterior exposed steel scheduled to be painted if not galvanized: Tnemec Tneme-Zinc 90-97 or equal by Carboline or Ameron.
  - 2. Refer to specification section "Painting and Coatings" for primer for interior exposed steel scheduled to be painted.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint for re-galvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight and complying with DOD-P-21035 or SSPC-Paint 20.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M, formulated for 30-mil thickness per coat.
- D. Coordinate standard shop primers normally provided with the finish paint specifications for these items in Painting specifications. Metal fabricator will be required to provide the primers as specified in Painting specifications. All items scheduled to receive finish coats as specified in Painting specifications shall be prepared for primer in accordance with SSPC - SP 6, Commercial Blast Cleaning, or SSPC - SP3, Power Tool Cleaning, as recommended by the manufacturer for the types of primers installed.

## 2.7 FASTENERS/ANCHORS

- A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
  - 1. Provide stainless-steel fasteners for fastening aluminum.

- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3; with hex nuts, ASTM A 563, Grade C3; and, where indicated, flat washers.
- D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 2.
- E. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
  - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- F. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
- G. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

## 2.8 GROUT

- A. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, non-corrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- B. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Sure-grip High Performance Grout; Dayton Superior Corp.
  - 2. Five Star Grout; Five Star Products.
  - 3. Masterflow 928 and 713; Master Builders Technologies, Inc.
  - 4. Sealtight 588 Grout; W. R. Meadows, Inc.

## 2.9 FABRICATION

- A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- C. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.

1. Temperature Change (Range): 100 deg F (55.5 deg C).
- D. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Weld corners and seams continuously to comply with the following:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- G. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- H. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for re-assembly and coordinated installation.
- I. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- J. Fabricate joints that will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- K. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- L. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

## 2.10 MISCELLANEOUS METAL FABRICATIONS

### A. 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 woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 06 Sections.
2. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts that bear on wood structural connections and furnish steel washers elsewhere.

- B. Loose Bearing and Leveling Plates: Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

#### 2.11 MISCELLANEOUS FRAMING AND SUPPORTS

- A. Provide miscellaneous steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.
- B. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.
  - 1. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.
  - 2. Except as otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4 inch thick by 8 inches long.
  - 3. In addition to miscellaneous framing and supports provide specialized framing for the following:
    - a. Ceiling suspended toilet partitions (urinal partition).

#### 2.12 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices wherever possible and grind welds smooth and finish flush where exposed to view.
- B. Provide cutouts, fittings, and anchorages as required to coordinate assembly and installation with other work. Provide anchors, welded to trim, for embedding in concrete or masonry construction, spaced not more than 6 inches from each end, 6 inches from corners, and 24 inches o.c., unless otherwise indicated.
- C. Galvanize miscellaneous exterior steel trim and at indicated interior locations.
  - 1. Exterior locations.

#### 2.13 MISCELLANEOUS ALUMINUM TRIM

- A. Unless otherwise indicated, fabricate units from extruded aluminum shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices wherever possible and grind welds smooth and finish flush when exposed to view.
- B. Provide anchorages as required to coordinate assembly and installation with other work and if exposed approved by the Architect.

## 2.14 STEEL PIPE BOLLARDS

### A. Fixed Bollards

1. Bollards shall comply with ASTM F3016
  - a. Design bollard and foundation to withstand a 30-mph impact and requirements of applicable codes.
2. Fabricate 6" diameter pipe bollards, 48" above grade and 48" below grade or as indicated on drawings from Schedule 80 steel pipe. Fill bollards with concrete. Provide a rounded top.
3. Provide 1/8" thick HDPE bollard covers based on "Fixed Post Bollard Covers" by Cal Pipe Manufacturing, Downey, CA; or equal. Color as selected by the Architect.

## 2.15 COUNTERTOP SUPPORTS

- A. Provide stainless steel countertop supports for wall mounted countertops from 14-gauge sheet steel. Provide a triangle brace with top horizontal length two thirds of countertop depth and vertical portion to be secured to wall to be one half of countertop length. Fold all edge with 1" fold and all exposed edges to be hemmed. Supports shall be located at 30" o.c.

## 2.16 ABRASIVE NOSINGS

- A. Extruded Units: Aluminum units with abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Fabricate units in lengths necessary to accurately fit openings or conditions.
  1. Basis of Design: The basis of design product is "Supergrit Type 231 BF" as manufactured by Wooster Products, Inc. The following manufacturer's subject to compliance with requirements are accepted and equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. Balco, Inc.
    - b. Nystrom
  2. Apply clear lacquer to concealed surfaces of extruded units.

## 2.17 FINISHES – GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- B. Aluminum Surfaces: Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Finish metal fabrications after assembly.
- E. Finishes – Steel

1. Prepare surfaces to be primed in accordance with SSPC SP 2.
2. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
3. Do not prime surfaces in where field welding is required.
4. Interior Steel Members: Prime paint items with one coat.
5. Exterior Steel Members:
  - a. Galvanize after fabrication to ASTM A123/A123M.
  - b. Provide minimum G90 galvanized coating.

F. Finishes – Aluminum

1. Finish: To be selected by the Architect.
  - a. Clear Anodic Finish: Class 1, AAMA 611, AA-M12C22A41, Mechanical finish, nonspecular as fabricated, chemical finish, 0.7 mils or thicker.
  - b. Colored Anodic Finish: Class 2, AAMA 611, AA-M12C22A32/A34, Mechanical finish, nonspecular as fabricated, integral colored, chemical finish, 0.4 mils or thicker. Verify availability with manufacturers selected.
    - 1) Color: As selected by Architect.

G. Finishes – Stainless Steel

1. Finish: #4 Satin

2.18 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Installer must examine the areas and conditions under which miscellaneous and ornamental items are to be installed. Notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installing anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.
- B. Set sleeves in concrete with tops flush with finish surface elevations. Protect sleeves from water and concrete entry.

### 3.3 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.
- D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop-welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.
- E. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

### 3.4 SETTING LOOSE PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
- B. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the bearing plate before packing with grout.
  - 1. Use non-shrink, metallic grout in concealed locations where not exposed to moisture; use non-shrink, nonmetallic grout in exposed locations, unless otherwise indicated.
  - 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

### 3.5 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for securely to, and rigidly brace from, building structure.



### 3.6 INSTALLING METAL PIPE BOLLARDS

#### A. Embedded Bollards

1. Anchor bollards in concrete in formed or core-drilled holes not less than 8 inches deep and 3/4 inch larger than OD of bollard. Fill annular space around bollard solidly with nonshrink grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward bollard.
2. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
3. Fill bollards solidly with concrete, mounding top surface to shed water.

### 3.7 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
  1. Apply by brush or spray to provide a 2.0-mil minimum dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of the shop paint on miscellaneous metal is specified in specification section "Painting and Coatings."
- C. For galvanized surfaces, clean welds, bolted connections, and abraded areas, and apply galvanizing repair paint to comply with ASTM A780.

### 3.8 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 05 50 00



## SECTION 05 52 13 – PIPE AND TUBE RAILINGS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Aluminum pipe tube railings and accessories.

#### 1.3 REFERENCES

- A. ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM B210 – Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
- C. ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
- D. ASTM B241/A241M – Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
- E. ASTM B483 – Standard Specification for Aluminum and Aluminum and Aluminum-Alloy Drawn Tubes for General Purpose Applications.
- F. ASTM E935 – Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
- G. ASTM E985 – Standard Specification for Permanent Metal Railing Systems and Rails for Buildings.
- H. AAMA 607.1 – Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
- I. AAMA 611 – Voluntary Specification for Anodized Architectural Aluminum.
- J. AWS – Structural Welding Code.
- K. ACSE 7 – Wind Loads.
- L. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For the railings, brackets and items indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required.

- D. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
  - 1. Fittings and brackets.
  - 2. Indicate method of connecting members at intersections.
- E. Assembled sample of railing system, made from full-size components, including handrail. Sample need not be full height.
  - 1. Show connection of members at intersections.
- F. Delegated-Design Submittal: Submit design calculations, analysis data and shop drawings indicating compliance with dedicated design and performance requirements signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.
- G. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- H. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATION SUBMITTALS

- A. Welder current certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.
- B. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include a list of completed projects with project name, addresses, names of architects and owners, and other information specified.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm experienced in producing metal fabrications similar to those indicated for this Project with a record of successful in-service performance, and with sufficient production capacity to produce required units without delaying the Work.
- B. Welding Standards: Comply with applicable provisions of AWS - "Structural Welding Code."
- C. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

1.7 MOCKUP

- A. Provide a non-installed mockup consisting of a complete 4'-0" long full height section consisting of a mounting post, intermediate post, linear railing members, handrails, top rails, balusters, attached fittings and bracket all in the finish required.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.
- B. Coordination installation of anchorages for railings. 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.
- C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.9 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

1.10 PERFORMANCE REQUIREMENTS

- A. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on performance requirements.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
- C. Temperature Change: 120 deg. F, ambient; 180 deg. F, material surfaces.
- D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

- E. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity, horizontal, uniform and concentrated loads and stresses within limits and under conditions indicated as indicated by applicable codes.
- F. Delegated-Design: Provide delegated design services including calculations and shop drawings for railings and load bearing items to comply with performance requirements, applicable code requirements and design criteria signed and sealed by an engineer registered in the State of Florida.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer shall be one of the following in each category however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Aluminum Pipe and Tube Railings:
    - a. Superior Aluminum Products, Inc.
    - b. Tubular Specialties Manufacturing, Inc.
    - c. Wagner, R & B, Inc.; a division of the Wagner Companies

### 2.2 ALUMINUM RAILING

- A. Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand design loads.
  - 1. Handrails, Rails, and Posts: 1-1/2-inch outside diameter, schedule 40 minimum.
  - 2. Picket Infill: 1/2-inch 0.083" thick minimum round pickets spaced 4 inches o.c.,
  - 3. Lower Rails: 1-1/2-inch, schedule 40 minimum.
- B. Railing Welded Connections: Fabricate railings with welded connections.
- C. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
  - 1. For railings, provide cast aluminum fittings, t-brackets, escutcheons, wall brackets, fasteners, and sleeves.
  - 2. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.
  - 3. Fasteners for Interconnecting Railing Components: Provide concealed spigots and fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.

## 2.3 FASTENERS

- A. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
  - 1. Frame construction: Prepare backing plate for mounting in wall.
  - 2. Exposed Fasteners: Flush countersunk screws or bolts consistent with design of railing.
- B. Bolts, Nuts, and Washers: Type 304 stainless steel.
- C. Toggle Bolts: Type 304 stainless steel.
- D. Anchor Bolts: Type 304 stainless steel.
- E. Post-Installed Torque-controlled Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
  - 1. Exterior: Alloy stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
- F. Provide adjustable brackets and flanges, with aluminum inserts for casting in concrete where indicated.

## 2.4 MATERIALS

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Extruded Bars Tubing: ASTM B 221, Alloy 6063-T5/T52.
- C. Extruded Structural Pipe Round Tubing: ASTM B 429/B 429M, Alloy 6063-T6.
  - 1. Provide Standard Weight (Schedule 40) pipe minimum, unless otherwise indicated.
- D. Drawn Seamless Tubing: ASTM B 210, Alloy 6063-T832.
- E. Plate and Sheet: ASTM B 209, Alloy 6061-T6.
- F. Die and Hand Forgings: ASTM B 247, Alloy 6061-T6.
- G. Brackets, Flanges and Anchors: Cast or formed metal of same type of material and finish as supported rails unless indicated otherwise.
- H. Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.

## 2.5 MISCELLANEOUS MATERIALS

- A. Welding Materials: AWS type required for welded materials, provide metal type as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- B. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M, formulated for 30-mil thickness per coat.
- D. Aluminum to Steel Isolation Gaskets: Provide #15 asphalt impregnated felt gaskets between aluminum to steel bolted connections. Trim gasket tight to mounting base plate.

## 2.6 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads. Railings shall be fabricated by one manufacture.
- B. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for re-assembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove flux immediately.
  - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
  - 5. Form changes in directions by bending or utilizing prefabricated elbow fittings
    - a. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
  - 6. Connect members where required with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- F. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.



- G. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- H. Close exposed ends of railing members with prefabricated end fittings.
- I. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- J. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
- K. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.
- L. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage and space devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- M. Fillers: Provide fillers made from plate material, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.
- N. Fabricate system to accommodate railing anchor plates.

## 2.7 FINISH

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- B. Aluminum Surfaces: Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Provide exposed fasteners and brackets with a finish matching the railings, unless indicated otherwise.
- E. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- F. Color Anodic Finish: Class I, AA-M12C22A42/A44 Mechanical Finish, nonspecular as fabricated Chemical Finish, etched Anodic Coating, integrally colored or electrolytically deposited color coating 0.07 mil or thicker complying with AAMA 611. Complying with manufacturer's written instructions for cleaning, preparing, pretreating and apply coating to exposed metal surfaces.
  - a. Color: As selected by Architect from full range of industry colors and color densities.

## 2.8 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

### 3.2 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
  - 1. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
  - 2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Corrosion Protection: Coat concealed surfaces that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

### 3.3 ANCHORING POSTS

- A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Leave anchorage joint exposed with anchoring material flush with adjacent surface.

### 3.4 ATTACHING RAILINGS

- A. Attach railings to wall with wall brackets, except where end flanges are used. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

- B. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
  - 1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Secure wall brackets and railing end flanges to building construction as follows:
  - 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.

### 3.5 ADJUSTING AND CLEANING

- A. Clean by washing thoroughly with clean water and soap and rinsing with clean water.

### 3.6 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

### 3.7 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 05 52 13



## SECTION 06 10 00 – ROUGH CARPENTRY

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Miscellaneous blocking, grounds and nailers.

#### 1.3 REFERENCES

- A. ALSC (American Lumber Standards Committee) – Softwood Lumber Standards.
- B. EWA (The Engineered Wood Association).
- C. APA (American Plywood Association).
- D. AWPA U1 – Use Category System- User Specification for Treated Wood.
- E. AWPA P5 – Standard for Waterborne Preservatives.
- F. AFPA (American Forest and Paper Association).
- G. ANSI/APA (American National Standards Institute/American Plywood Association).
- H. ASTM C645 – Standard Specification for Nonstructural Steel Framing Members.
- I. ASTM C653/C653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- J. ASTM D226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- K. MFMA (Metal Framing Manufacturer's Association) – Guidelines for the Use of Metal Framing.
- L. HPVA HP-1 – Hardwood Plywood and Veneer Association.
- M. Voluntary Product Standards PS-20 and PS-1.
- N. Grading rules of Southern Pine.
- O. FSC – Forestry Stewardship Council.
- P. SFI – Sustainable Forestry Initiative.
- Q. AMTF – American Tree Farm System.
- R. FBC – Florida Building Code.

#### 1.4 DEFINITIONS

- A. Rough carpentry includes carpentry work not specified as part of other Sections and generally not exposed, unless otherwise specified.

## 1.5 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. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
- B. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- C. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

## 1.6 INFORMATION SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated wood.

#### 1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for 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.

#### 1.8 FIELD CONDITIONS

- A. Examine substrates and supporting structure and the conditions under which work is to be installed. Do not proceed with the installation until unsatisfactory conditions have been corrected.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.
  - 1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.
  - 2. Keep treated wood waste separated from other wood to be recycled or reused as mulch. Discard in a legal manner.

#### 1.10 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

### PART 2 – PRODUCTS

#### 2.1 LUMBER, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
- B. Lumber Standards: Furnish lumber manufactured to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- C. Inspection Agencies: SPIB - Southern Pine Inspection Bureau.
- D. Grade Stamps: Provide lumber with each piece factory-marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

- E. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
  - 1. Provide dressed lumber, S4S, unless otherwise indicated.
  - 2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.

## 2.2 WOOD GROUNDS, NAILERS AND BLOCKING

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including blocking, nailers, and similar items.
- B. Lumber for blocking may be any grade and classified standard and better for western species or classified No. 2 for Southern Pine SPIB. Plywood shall not be used for blocking materials.
- C. Provide lumber for support or attachment of other construction including rooftop equipment curbs and support bases, grounds, and similar members.
- D. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
- 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. Wood grounds, nailers, and sleepers shall be pressure treated as specified herein. The manufacturer and applicator of pressure treatment shall mark all wood.

## 2.3 METAL BLOCKING

- A. Provide metal blocking studs and backing plates for support or attachment of other construction and miscellaneous items per the specification section "Non-structural Metal Framing."
- B. Metal blocking is to be used in areas only which will not accommodate adequate wood blocking of sufficient size to provide proper support on attachment.
- C. Metal blocked to be the same depth, finish as partition studs and minimum 20-gauge, conforming to ASTM C 645.
- D. Backing plates shall be minimum 6" high and length as required and minimum 16-gauge, conforming ASTM A653/658 or G40 hot dip galvanized unless indicated otherwise.

## 2.4 PLYWOOD PANELS

- A. Construction Panel Standards: Panels thick comply with DOC PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood construction panels and, for products not manufactured under PS 1 provisions, with APA PRP-108. Furnish construction panels that are each factory-marked with APA trademark. Furnish construction panels that are each factory-marked with APA trademark.
  - 1. Provide exterior AC plywood 1/2" and 3/4' as indicated on the drawings.
  - 2. Provide painted exterior AC plywood 3/4" thick with fire retardant paint "Firefree Class A" as manufactured by Firefree Coatings, Inc. where indicated.



3. Provide preservative-treated where indicated.

## 2.5 EQUIPMENT PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood construction panels and, for products not manufactured under PS 1 provisions, with APA PRP-108. Furnish construction panels that are each factory-marked with APA trademark.
  1. Panels: Paint exterior AC plywood 3/4" thick with fire retardant paint "Firefree Class A" as manufactured by Firefree Coatings, Inc.
  2. Panels: Exterior grade, AC, fire-retardant treated 3/4" thick.

## 2.6 FASTENERS

- A. Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power Driven Fasteners: National Evaluation Report NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening to Metal Framing: ASTM C 954, except with wafer heads and reamer wins, length as recommended by screw manufacturer for material being fastened.
- F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) 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.
- I. Treated Wood: Provide stainless steel fasteners of a type and size required for attachment.

## 2.7 PRESERVATIVE WOOD TREATMENT BY PRESSURE PROCESS

- A. Where lumber or plywood is indicated as preservative-treated wood or is specified herein to be treated, comply with applicable requirements of AWPA Standards C2 (Lumber) and C9 (Plywood). Mark each treated item with the AWPB or SPIB Quality Mark Requirements.
- B. Preservative Treatment by Pressure Process: AWPA 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.

- C. Pressure-treat above-ground items with water-borne preservatives to a minimum retention of 0.25 pcf. For interior uses, after treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent. Treat indicated items and the following:
  - 1. Wood nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
  - 3. Wood framing members less than 18 inches above grade.
  - 4. Wood floor plates installed over concrete slabs directly in contact with earth.
- D. Pressure-treat wood members in contact with the ground or fresh water with water-borne preservatives to a minimum retention of 0.40 pcf.
- E. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces to comply with AWWPA M4. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

## 2.8 ENVIRONMENTAL

- A. Manufacturers: Submit manufacturer's documentation substantiating the requirements for each type of materials as indicated:
  - 1. Provide Letter of Certification(s) for Sustainable Forestry from one of the following:
    - a Forestry Stewardship Council – (FSC)
    - b Sustainable Forestry Initiative – (SFI)
    - c American Tree Farm System – (AMTF)
  - 2. Provide letter of certification signed by lumber supplier, indicating compliance with sustainable organization requirements and identify certifying organization.
  - 3. Submit organization certification numbers; identify each certified product on a line-item basis.
  - 4. Submit copies of invoices bearing the sustainable organization certification numbers.
- B. Ureaformaldehyde: No ureaformaldehyde products shall be added or allowed in any products.
- C. Adhesives: For adhesives, including printed statement of VOC content.
- D. Composite Wood: For composite-wood products, documentation indicating that product contains no urea formaldehyde.
- E. Recycled Content: Recycled Content of Medium-Density Fiberboard and Particleboard: Provide products with an average recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 20 percent.
- F. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.
  - 1. Use adhesive that has a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

- G. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Wood Glues: 30 g/L.
  2. Contact Adhesive: 250 g/L.

## PART 3 – EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of construction and that are too small to use in fabricating rough carpentry with minimum joints or optimum joint arrangement.
- B. Set rough carpentry to required levels and lines, with members plumb and true to line and cut and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Coordinate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.
- E. Use screws, unless otherwise indicated. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

### 3.2 BLOCKING GROUNDS AND NAILERS

- A. Install blocking, grounds and nailers where shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other Work involved.
- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- C. Install permanent grounds of dressed, 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 involved. Remove temporary grounds when no longer required.
- D. Wood blocking shall be provided for all wall bumpers and wall mounted doorstops.

### 3.3 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 06 10 00



## SECTION 06 16 00 – SHEATHING

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Wall Plywood Sheathing.
    - b. Wall cementitious sheathing.

#### 1.3 REFERENCES

- A. ALSC – American Lumber Standards Committee – Softwood Lumber Standards.
- B. EWA – The Engineered Wood Association.
- C. APA – American Plywood Association.
- D. AFPA – American Forest and Paper Association.
- E. APA (American Plywood Association).
- F. AWPA U1 – Use Category System- User Specification for Treated Wood.
- G. MFMA (Metal Framing Manufacturer’s Association) – Guidelines for the Use of Metal Framing.
- H. ANSI/APA – American National Standards Institute/American Plywood Association.
- I. Voluntary Product Standards PS 1.
- J. Grading rules of Southern Pine.
- K. ASTM C1325 – Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.
- L. ASTM D226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- M. ASTM E72 – Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
- N. ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.
- O. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- P. FSC – Forestry Stewardship Council.
- Q. SFI – Sustainable Forestry Initiative.
- R. AMTF – American Tree Farm System.
- S. FBC – Florida Building Code.

#### 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.
- B. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- C. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATION SUBMITTALS

- A. Product certificates signed by manufacturer certifying that products comply with specified requirements.
- B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect material during transit, delivery, storage, and handling to prevent damage, soiling, and deterioration.
- B. 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.

1.7 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Manufacturers are as indicated however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.

2.2 GENERAL

- A. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- B. Factory mark panels to indicate compliance with applicable standard.

2.3 WALL PLYWOOD SHEATHING

- A. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Georgia Pacific Wood Products, LLC
  - 2. Louisiana Pacific Plywood Corp.
  - 3. Weyerhaeuser NR Company
- B. Plywood Sheathing: Comply with PS 1, exterior structural 1 sheathing with grade stamps.
  - 1. Thickness: 5/8 inch.
  - 2. Width: 4 feet.
  - 3. Length: 8 feet.
  - 4. Edges: Square.
  - 5. Span Rating: Not less than 24/0

2.4 WALL CEMENTITIOUS SHEATHING

- A. Basis of Design: “Durock” as manufactured by USG Corporation
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Georgia-Pacific Gypsum LLC
  - 2. CertainTeed Corporation

C. Cementitious Sheathing: Comply with ASTM C1325

1. Thickness: 5/8 inch
2. Width: 4 feet
3. Length: 8 feet
4. Edges: Manufacturers standard

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture and compliance with product approval where applicable.
1. 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: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. 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.
- E. Screws for Fastening Gypsum Sheathing or Cementitious Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.
1. For steel framing less than 0.0329 inch thick, use screws that comply with ASTM C 1002.
  2. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C 954.

2.6 ENVIRONMENTAL

- A. Products: Not less than 50 percent (by cost) of wood-based materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- B. Forest Stewardship Council (FSC): Provide letter of certification signed by lumber supplier. Indicate compliance with FSC "Principles for Natural Forest Management" and identify certifying organization.
- C. Certification: Submit FSC certification numbers, identify each certified product on a line-item basis.
- D. Ureaformaldehyde: No ureaformaldehyde products shall be added or allowed in any products.
- E. Adhesives: For adhesives, including printed statement of VOC content.
- F. Composite Wood: For composite-wood products, documentation indicating that product contains no urea formaldehyde.



- G. Recycled Content: Recycled Content of Medium-Density Fiberboard and Particleboard: Provide products with an average recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 20 percent.
- H. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.
  - 1. Use adhesive that has a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- I. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Wood Glues: 30 g/L
  - 2. Contact Adhesive: 250 g/L
- J. Submit manufacturer's certification that products comply with VOC limits when calculated according to 40CFR 59, Subpart D (EPA Method 24).
- K. Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
- L. Submit Green Seal Certification to GS-36 and description of the basis of certification.
- M. Submit manufacturer's certification that products comply with SCAQMD #1168. Submit manufacturer's certification that products comply with SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions do exist or direct exposure to moisture can occur, submit manufacturer's certification that products comply with Bay Area AQMD Reg. 8, Rule 51 for containers larger than 16 oz with California Air Resources Board (CARB) for containers 16 oz or less.
- N. Adhesives: For adhesives used to laminate gypsum board panels to substrates, including printed statement of VOC content.
- O. Recycled Content: Provide gypsum panel products with recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content constitutes a minimum of 20 percent by weight.
- P. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
  - 1. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- Q. 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. Recycled Content: Provide blankets with recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content constitutes a minimum of 20 percent by weight.
- R. Provide sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## 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 applicable building codes.
- D. 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 wall and parapet 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.

### 3.2 WOOD SHEATHING INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of fasteners for structural-use panels and applications indicated.
- B. Comply with applicable recommendations contained in Form No. E30, "APA Design/Construction Guide – Residential & Commercial," for types of construction panels and applications indicated.

### 3.3 CEMENTITIOUS SHEATHING INSTALLATION

- A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.
- B. Install with 1/4-inch gap where panels abut other construction or penetrations.

### 3.4 BUILDING PAPER INSTALLATION

- A. General: Cover sheathing with weather-resistant sheathing paper as follows:
  - 1. Cut back barrier 1/2 inch on each side of the break in supporting members at expansion- or control-joint locations.
  - 2. Apply barrier to cover vertical flashing with a minimum 4-inch overlap, unless otherwise indicated.

- B. Building Paper: Apply horizontally with a 2-inch overlap and a 6-inch end lap; fasten to sheathing with galvanized staples or roofing nails.

3.5 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 06 16 00



## SECTION 06 20 00 – FINISH CARPENTRY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Miscellaneous interior woodwork.
    - b. Miscellaneous plastic laminate.
    - c. Miscellaneous clad items.

#### 1.3 REFERENCES

- A. ALSC (American Lumber Standards Committee) – Softwood Lumber Standards.
- B. EWA (The Engineered Wood Association).
- C. APA (American Plywood Association).
- D. AWPA U1 – Use Category System- User Specification for Treated Wood.
- E. AWPA P5 – Standard for Waterborne Preservatives.
- F. AFPA (American Forest and Paper Association).
- G. ANSI/APA (American National Standards Institute/American Plywood Association).
- H. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- I. AWI – Quality Standards.
- J. NEMA (National Electric Manufacturer's Association) LD3 – High Pressure Decorative Laminates.
- K. Voluntary Product Standards PS-20 and PS-1.
- L. HPVA HP-1 – Hardwood Plywood and Veneer Association.
- M. Grading rules of Southern Pine.
- N. FSC – Forestry Stewardship Council.
- O. SFI – Sustainable Forestry Initiative.
- P. AMTF – American Tree Farm System.
- Q. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Provide manufacturer's product data for purchased items installed in millwork prior to delivery and for each type of product and process specified in this section and incorporated into items of architectural woodwork during fabrication, finishing, and installation.

- B. Submit complete shop drawings by approved fabricator for proposed millwork items requiring shop fabrication processes.
- C. Samples of:
  - 1. Proposed solid woods for transparent finish (three 3/4 inch by 3 inch by 8 inch pieces of each species and cut).
  - 2. Proposed veneered woods for transparent finish (three 3/4 inch by 8 inch by 8 inch pieces of each species and cut).
  - 3. Available color and pattern choices for plastic laminate surfacing (one complete chain).
- D. Product certificates signed by woodwork manufacturer certifying that products comply with specified requirements.
- E. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- F. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 QUALITY ASSURANCE

- A. Quality Standards: Except as otherwise shown or specified, comply with specified provisions of the Architectural Woodwork Institute (AWI) "Quality Standards."
- B. Optimum Moisture Content: Kiln-dry woodwork to an average moisture content within the following ranges or as otherwise recommended by applicable Quality Standards for the regional climatic conditions involved.
  - 1. Interior woodwork - 5 to 10 percent.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soiling, and deterioration.
- B. Do not deliver woodwork until painting, wet work, grinding, and similar operations which could damage, soil, or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, woodwork must be stored in other than installation areas, store only in areas which meet the requirements specified for installation areas.

1.7 PROJECT CONDITIONS

- A. Examination of Substrate and Conditions: The Installer must examine the substrate and the conditions under which the Work under this Section is to be performed and notify the Contractor in writing of any unsatisfactory conditions. Do not proceed with Work under this Section until unsatisfactory conditions have been corrected.
- B. Do not install woodwork until the required temperature and relative humidity have been stabilized in installation areas.
- C. Maintain temperature and relative humidity as required for a tolerance of plus or minus one percent of the specified optimum moisture content until woodwork receives specified finishes. Maintain temperature and humidity conditions until acceptance of the Work by the Owner.
- D. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before manufacturing woodwork; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of work.
- E. Protect installed woodwork from damage by other trades until Owner's acceptance of the Work. Advise Contractor of required protection procedures.

1.8 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

PART 2 - PRODUCTS

2.1 INTERIOR MATERIALS

- A. General: Provide materials that comply with requirements of the AWI Woodworking Standard for each type of woodwork and quality grade indicated and, where the following products are part of woodwork, with requirements of the referenced product standards, that apply to product characteristics indicated:
  - 1. Softwood Plywood: PS 1.

2. Hardwood Plywood and Face Veneers: HPVA HP-1.
3. Lumber: PS 20.
4. Trim:
  - a. Softwood Species: Fir, select
  - b. Hardwood Species: White Oak
  - c. Finish: Paint
  - d. Finger Joining: Not allowed
  - e. Face Surface: Smooth
5. High Pressure Laminate: NEMA LD3.
6. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:
  - a. Hardwood Plywood: HPMA FE
7. Chair Rail
  - a. Hardwood Species: As selected by Architect.
  - b. Type and Style: As selected by Architect.
  - c. Finish: As selected by Architect.
  - d. Finger Joining: Not allowed.
  - e. Face Surface: Smooth.

## 2.2 MISCELLANEOUS LAMINATE CLAD ITEMS

- A. Laminate clad casework shall comply with custom grade quality standards as set forth in AWI, Section 400, Division 400B, "Laminate Clad Cabinets."
- B. High Pressure Plastic Laminate (for miscellaneous millwork and paneling items).
  1. Plastic laminate except backing or balancing sheets shall be high pressure laminate conforming to NEMA LD-1985. Color shall be selected by the Architect from the full line of standard colors.
  2. Exposed Horizontal Surfaces: Shall be nominal .048 inch thick minimum with textured finish and conforming to NEMA standards for HGS horizontal grade.
  3. Exposed and Semi-Exposed, Interior and Exterior Vertical Surfaces: Shall be .028 inch thick minimum with low lustre textured finish and conforming to NEMA standards for VGS vertical grade.
  4. Backing Sheet for Concealed Surfaces: Shall be .028 or .020 inches thick, conforming to NEMA standards for VGS vertical grade or CL20 cabinet liner.
  5. Backing Sheet for Semi-Exposed Surfaces: Shall be .028 inches thick, conforming to NEMA standards for VGS vertical grade. Use to balance face laminate.
  6. Paneling (Plastic Laminate on Plywood): Shall be .048 conforming to HGS for face and all exposed edges.
- C. Plastic laminate color shall be as selected by the Architect.
- D. Manufacturer is as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
  1. Formica Corporation
  2. Laminart
  3. Nevamar Corp.
  4. Pioneer Plastics Corp.
  5. Arborite, Forbo



### 2.3 FASTENERS AND ANCHORS

- A. Screws: Select material, type, size, and finish required for each use. Comply with FS FF-S-111 for applicable requirements.
  - 1. For metal framing supports, provide screws as recommended by metal framing manufacturer.
- B. Anchors: Select material, type, size, and finish required by each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.
- C. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.
  - 1. Low-Emitting Materials: Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

### 2.4 FINISH

- A. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces and similar preparations for finishing of architectural woodwork, as applicable to each unit of work.
- B. For painted finishes, refer to the Painting Specifications for final finishing of installed architectural woodwork and for material and application requirements of prime coats and final finish for woodwork.

### 2.5 ENVIRONMENTAL

- A. Manufacturers: Submit manufacturer's documentation substantiating the requirements for each type of materials as indicated:
  - 1. Provide Letter of Certification(s) for Sustainable Forestry from one of the following:
    - a. Forestry Stewardship Council – (FSC)
    - b. Sustainable Forestry Initiative – (SFI)
    - c. American Tree Farm System – (AMTF)
  - 2. Provide letter of certification signed by lumber supplier, indicating compliance with sustainable organization requirements and identify certifying organization.
  - 3. Submit organization certification numbers; identify each certified product on a line-item basis.
  - 4. Submit copies of invoices bearing the sustainable organization certification numbers.
- B. Ureaformaldehyde: No ureaformaldehyde products shall be added or allowed in any products.
- C. Adhesives: For adhesives, including printed statement of VOC content.
- D. Composite Wood: For composite-wood products, documentation indicating that product contains no urea formaldehyde.

- E. Recycled Content: Recycled Content of Medium-Density Fiberboard and Particleboard: Provide products with an average recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 20 percent.
- F. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.
  - 1. Use adhesive that has a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- G. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Wood Glues: 30 g/L.
  - 2. Contact Adhesive: 250 g/L.
- H. Adhesives: Adhesives for or site installation or factory fabrication: Submit manufacturer's documentation substantiating the following requirements for each type of materials provided per this specification:
  - 1. Data: Product data for adhesives as indicated.
  - 2. Submit manufacturer's certification that products comply with VOC limits when calculated according to 40CFR 59, Subpart D (EPA Method 24).
  - 3. Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
  - 4. Submit Green Seal Certification to GS-36 and description of the basis of certification.
  - 5. Submit manufacturer's certification that products comply with SCAQMD #1168. Submit manufacturer's certification that products comply with SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions do exist or direct exposure to moisture can occur, submit manufacturer's certification that products comply with Bay Area AQMD Reg. 8, Rule 51 for containers larger than 16 oz with California Air Resources Board (CARB) for containers 16 oz or less.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Condition finish carpentry to average prevailing humidity conditions in installation areas prior to installing.
- B. Before installing finished carpentry, examine shop fabricated work for completion and complete work as required, including back priming and removal of packing.

#### 3.2 FINISH CARPENTRY INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for same grade specified in Part 2 of this section for type of woodwork involved.
- B. Install, plumb, level, true, and straight with no distortions. Shim as required using concealed shims.

- C. Cut to fit unless specified to be shop fabricated or shop cut to exact size. Where woodwork abuts other finished work, scribe and cut for accurate fit. Before making cutouts, drill pilot holes at corners.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use screws or fine finishing nails for exposed fasteners, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.
- E. Distribute defects allowed in the quality grade specified to the best overall advantage when installing job assembled woodwork items.

### 3.3 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 06 20 00



## SECTION 06 41 16 – PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Plastic-laminate-faced architectural cabinets.

#### 1.3 REFERENCES

- A. Plywood Product Standards: Comply with PS 1 (ANSI A199.1) or, for products not manufactured under PS 1 provisions, with applicable APA Performance Standard PRP-108 for type of panel indicated.
- B. ANSI/APA (American National Standards Institute/American Plywood Association).
- C. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. AWI – Quality Standards.
- E. BHMA A156.9 – Cabinet Hardware.
- F. FED MMM-A-130 – Adhesive, Contact.
- G. NEMA (National Electric Manufacturer's Association) LD3 – High Pressure Decorative Laminates.
- H. PS 1 – Construction and Industrial Hardwood.
- I. PS 20 – American Softwood Lumber Standard.
- J. Voluntary Product Standards PS 20-70.
- K. Grading rules of Southern Pine.
- L. FSC – Forestry Stewardship Council.
- M. SFI – Sustainable Forestry Initiative.
- N. AMTF – American Tree Farm System.
- O. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
  - 1. Indicate quality grade, materials, species, construction, sizes, shapes, quantities, locations, and conditions of adjoining work.
  - 2. Indicate items in related or dimensional position with sections or details shown either full size or 3" = 1'-0" scale.

3. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
  4. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural plastic-laminate cabinets.
- B. Samples for Initial Selection:
1. Plastic laminates and materials
  2. Accessories
- C. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- D. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.
- E. Manufacturers: Submit manufacturer's documentation substantiating the requirements for each type of materials as indicated:
1. Provide Letter of Certification(s) for Sustainable Forestry from one of the following:
  2. Forestry Stewardship Council – (FSC)
  3. Sustainable Forestry Initiative – (SFI)
  4. American Tree Farm System – (AMTF)
  5. Provide letter of certification signed by lumber supplier. Indicating compliance with organization requirements and identify certifying organization.
  6. Submit organization certification numbers; identify each certified product on a line-item basis.
  7. Submit copies of invoices bearing the organization certification numbers.
- F. Manufacturers: Submit manufacturer's documentation substantiating the requirements for each type of materials as indicated:

1. Provide Letter of Certification(s) for Sustainable Forestry.
2. Forest Stewardship Council (FSC): Provide letter of certification signed by lumber supplier. Indicate compliance with FSC "Principles for Natural Forest Management" and identify certifying organization.
3. Submit FSC certification numbers; identify each certified product on a line-item basis.
4. Submit copies of invoices bearing the FSC certification numbers.

G. Manufacturer's fully assembled cabinet must be GREENGUARD GOLD certified.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of product, signed by product manufacturer.
- C. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturers with at least five (5) years experience making the specified materials as a current catalog and regular production item. Manufacturer shall employ skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance and is a certified participant in AWI's Quality Certification Program.
- B. Installer Qualifications: Employ only experienced Installers skilled in the successful installation of the specified materials and assemblies on similar projects for a minimum of five (5) years and are certified participant in AWI's Quality Certification Program.
- C. Source Limitations: Provide products of the same manufacturer for all cabinets.
- D. Fire Hazard Classification: Comply with required NFPA, ANSI, and UL surface burning characteristics for plastic laminates, lumber, and plywood.
- E. All cabinets shall comply with AWI's Woodwork Quality Standards for grades of interior architectural woodwork, construction, finishes and other requirements.
  1. Provide AWS Certificate with shop drawings indicating that the woodwork complies with the requirements of the grades specified.

#### 1.7 DEFINITIONS

- A. Exposed Portions of Casework: Bottoms of casework more than two feet above floor shall be considered as exposed. Visible members in open cases also shall be considered as exposed portions.
- B. Semi-Exposed Portions of Casework: Includes those members such as divisions, interior faces of ends, case back, backs and bottoms.

- C. Concealed Portions of Casework: Include panels and other surfaces not usually visible after installation.

#### 1.8 MOCK-UP

- A. Submit a sample of the cabinet, if the sample deviates from the specification and Design Criteria in any way, the Contractor must submit a substitution request. If the product is comparable to the specification, the Contractor must submit a comparable product request.
- B. Sample does not have to be full scale but large enough to display all the materials listed in this standard to include: fronts, tops, backs, sides laminate, shelf, pulls, slides, backing, rails, hinges, base, doors and drawers.
- C. The sample may be an on-site mockup and may be used as part of work upon Architect approval.

#### 1.9 PRE-INSTALLATION MEETING

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

#### 1.11 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. All cabinets shall be manufactured in a climate-controlled environment, stored after fabrication in a climate controlled (temperature and humidity) storage area and shipped to the jobsite in an enclosed container (semi-tractor trailer).
- C. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- D. Coordinate work with plumbing, mechanical, electrical, and other trades for rough-in work and installation of adjacent and associated components.
- E. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.



- F. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
- G. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.

#### 1.12 WARRANTY

- A. Cabinet Manufacturer shall warrant all casework products against manufacturing defects in materials and workmanship for a period of five (5) years.
- B. Manufacturer shall warrant against structural failure of the cabinet body for a period of ten (10) years.
- C. Installers Warranty: The installer shall warrant the entire installation against defects in material and workmanship for a period of one (1) years.
- D. Duration of all warranties shall begin on the date of Substantial Completion.
- E. Products will be repaired or replaced by Manufacturer, without cost to the Owner.

#### 1.13 PERFORMANCE

- A. Manufacturers shall have independently tested their products and be able to submit documentation of results meeting SEFA requirements. Testing under SEFA 8. Cabinet Structural Tests (Sections 4.0, 5.0, 6.0, 7.0 and 9.0) and Table Structural Tests (Section 10.0) required.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Fabricators: Fabricators shall provide products subject to compliance with requirements and criteria as indicated.

#### 2.2 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.
  - 1. Provide labels and certificates from AWI certification program indicating that woodwork, including installation, complies with requirements of grades specified.
  - 2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

- B. Grade: Custom
- C. Type of Construction: Frameless.
- D. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.
- E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.
  - 1. Laminate Cladding for Exposed Surfaces:
    - a. Horizontal Surfaces: Grade HGP (.039) - Horizontal Grade, High Pressure Decorative Laminate.
    - b. Vertical Surfaces: Grade HGP (.039) - Horizontal Grade, High Pressure Decorative Laminate.
    - c. Concealed Backing: Grade BKH (.028) - High Pressure Backer.
    - d. Cabinet Liner: Grade CLS (.020) - High Pressure Cabinet Liner.
  - 2. Materials for Semi-Exposed Surfaces:
    - a. Surfaces not specifically indicated: High-pressure decorative laminate, NEMA LD 3, Grade CLS.
    - b. Concealed Backing: Grade BKH (.028) - High Pressure Backer.
    - c. Cabinet Liner: Grade CLS (.020) - High Pressure Cabinet Liner.
    - d. For semi-exposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade CLS.
  - 3. Dust Panels: 1/4-inch plywood above compartments and drawers unless located directly under tops
  - 4. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.
  - 5. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces as selected by Architect from laminate manufacturer's full range in the following categories.
    - a. Solid colors.
    - b. Wood grains.
    - c. Patterns.
    - d. Finish Types
  - 6. Manufacturer is as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. Wilsonart International – HD – High Definition Type HGP 376
  - 7. Edges: PVC edge binding, .12" thick matching laminate in color or as selected by the Architect.
- F. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
  - 1. Wood Moisture Content: 5 to 10 percent.
- G. Core Material:
  - 1. Provide millwork or casework plywood cores of hardwood plywood "Veneer Core" Grade AA, with no-added-Urea Formaldehyde adhesives.
    - a. Use 3/4" thick, closed-grain hardwood plywood typical unless noted otherwise.
    - b. Use 1/4" thick hardwood plywood at indicated locations.

2. Marine Grade Plywood: 3/4" specially designed panel made entirely of Douglas-fir or Western Larch. The grade of all plies of veneer is B or better. Exposure rating is EXTERIOR and the glue used is a fully waterproof structural adhesive. (Marine grade plywood shall be used for sink cabinets and countertops and backsplashes within 3'-0" of sink areas).
3. Softwood Plywood: 3/4" CDX pressure treated plywood DOC PS 1.
4. Hardwood plywood, 1/4" and 1/2" thick veneer core Grade AA, HPVA HP-1 formaldehyde free, water resistant exterior glue.
5. Lumber: Solid wood hardwood, 1/2", 3/4" or as indicated kiln-dried, select Poplar, Fir or Grade III mill option.

### 2.3 MISCELLANEOUS MATERIALS

- A. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- B. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- C. Adhesives: Do not use adhesives that contain urea formaldehyde. Water based low Volatile Organic Compound (VOC) Non-toxic, PVA adhesive.

### 2.4 HARDWARE

- A. Hinges: Steel Institutional 2-3/4-inch, five-knuckle with interlaying leaves, 0.095-inch-thick metal.
- B. Door Catches: Provide heavy duty, spring loaded, large 11/16" diameter roller mounted catch at bottom edge of door. All doors over 48" in height shall have top and bottom catches. At double doors provide cast aluminum "Ives #2 Elbow Catch" at inactive leaf. Pull chains not permitted. At wardrobe cabinets provide fixed shelf at center of unit for catch mounting.
- C. Pulls: Solid 5" stainless-steel wire pulls 2-1/2" deep and 5/16" in diameter, fastened from back with two screws. Provide two pulls for drawers more than 24 inches wide. Pull design shall comply with Americans with Disability Act (ADA).
- D. Chain Stops: Provide at doors that open towards other finished materials, equipment or building components such as existing and future appliances, walls and other cabinets. Provide 12" long chain with 1-1/2" x 1" attachment plates at either end. Install near top of cabinet door so the door will not open beyond 90 degrees and less if required so the door handle will not hit adjacent surfaces.
- E. Shelf Supports: L-shaped 0.25" metal pin shelf rests complying with BHMA A156.9, Type B04013.
- F. Drawer Slides: Standard clear zinc finish, ball bearing rollers, and 100 pounds dynamic load, Model #8400 by K&V or approved equal and for file drawers 150 pounds dynamic load, Model #8600 by K&V or approved equal.

- G. Locks: Cylinder type with 5-disc tumbler mechanism and keyed to room entry door. Provide on all doors and drawers, on pair of doors the left leaf shall be provided with a concealed spring-loaded manual latch and the lock shall be located on the right door. Each area or room shall be keyed alike and keyed to main entry door.
- H. Door and Drawer Silencers: Clear soft-stem bumpers #32479 as manufactured by Rockler Woodworking & Hardware or approved equal. Provide at all doors and drawers.
- I. Finish: Satin chrome US 26D.
- J. Finish: Satin stainless steel US 32D.

## 2.5 FABRICATION

### A. General:

- 1. All exposed cabinet edges shall be beveled or rounded to prevent sharp edges or corners.
- 2. All counter tops shall have rounded edges, and exposed corners rounded with minimum 1/2" radius.
- 3. Provide plastic laminate finish on all exposed surfaces of doors, drawers, countertops, splashes, etc. of cabinets unless noted otherwise.

### B. Fabrication Workmanship:

- 1. Construct millwork items in accordance with specified quality grade of reference standards, except as otherwise specified or detailed.
- 2. Construct millwork items using materials specified for plastic laminate finish.

### C. Milling:

- 1. Fabricate and assemble work at mill as complete as practicable.
- 2. Deliver ready to assemble and set in place.
- 3. Machine sand all work at mill and deliver free of machine or tool marks or defects that will show through finish.

### D. Provide plastic laminate finish on all exposed surfaces of doors, drawers, countertops, splashes, etc. of cabinets unless noted otherwise.

### E. Countertops and Backsplashes:

- 1. See drawings and specifications for additional types of countertops.
- 2. Countertops: 3/4" plywood 1-1/2" thick edge and with high pressure plastic laminate.
- 3. Backsplashes: 3/4" plywood with high pressure plastic laminate.
- 4. Provide 3/4" thick marine grade plywood in within 3'-0" of sinks.
- 5. Provide 1" radius at exposed corners.

### F. Base: 4- inch high, 3/4" pressure treated plywood or lumber.

### G. Body: 3/4" plywood.

- 1. Tops, bottoms and sides to be glued and paneled.
- 2. High Pressure Plastic Laminate.
- 3. Provide 3/4" thick marine grade plywood for body where sinks are located.

- H. Cabinet Backs: Cabinet back shall be 1/2" plywood and shall be fully bound (dadoed) into sides, top and bottom, recessed 7/8" from the cabinet rear. Rear, unexposed side of back shall be toenailed to cabinet body with mechanical fasteners and solidified with a continuous bead of industrial grade hot melt adhesive to withstand a bond test as described in ANSI/WDMA I.W.1A. All cabinet backs shall have a minimum of two plywood laminate clad flush mounting blocks (hang rails).
- I. Hang rails shall be 3/4" x 4" high plywood and located at rear of cabinet back and on the inside and fastened to cabinet sides. Provide 2 hang rails at wall cabinet, 1 hang rail at base cabinet and three hang rails at tall cabinets.
- J. Doors: 3/4" plywood up to 36" wide and/or high and 1" thick over 36" wide and/or 36" high.
  - 1. Front and back: High Pressure Laminate.
- K. Shelving: 3/4" plywood, maximum 36" unsupported width, 1" for shelves over 36" wide up to 48" wide.
  - 1. Top and Bottom: High pressure laminate.
  - 2. Provide 1" radius at exposed corners in open shelving.
  - 3. Shelves shall be full depth.
- L. Drawer:
  - 1. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
  - 2. Join sub-fronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners.
  - 3. Front: 3/4" plywood with high pressure laminate face with cabinet liner on the back.
  - 4. Bottom: 1/4", plywood thermoset decorative panels fully bound (dadoed) into front, sides and back laminated with cabinet liner.
  - 5. Sides and back: 1/2" thick hardwood plywood.
- M. Body, Door, Drawer and Shelves Edges
  - 1. Edges: PVC edge band.
- N. Dust Panels: 1/4-inch plywood above compartments and drawers unless located directly under tops
- O. Construction Tolerances
  - 1. Gap between doors, drawers, panels and frames shall be 1/8".
- P. Fabricate cabinets to dimensions, profiles, and details indicated.
- Q. Plastic laminate shall be applied to the top of all tall cabinets and scribed to wall.
- R. Finish Hardware: Fit drawer guides and cabinet-mounted shelf standards at mill.
  - 1. Ship other finish hardware items loose for installation at job site.
- S. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

- T. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

## 2.6 ENVIRONMENTAL

- A. Products: Not less than 50 percent (by cost) of wood-based materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- B. Forest Stewardship Council (FSC): Provide letter of certification signed by lumber supplier. Indicate compliance with FSC "Principles for Natural Forest Management" and identify certifying organization.
- C. Certification: Submit FSC certification numbers, identify each certified product on a line-item basis.
- D. Ureaformaldehyde: No ureaformaldehyde products shall be added or allowed in any products.
- E. Adhesives: For adhesives, including printed statement of VOC content.
- F. Composite Wood: For composite-wood products, documentation indicating that product contains no urea formaldehyde.
- G. Recycled Content: Recycled Content of Medium-Density Fiberboard and Particleboard: Provide products with an average recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 20 percent.
- H. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.
  - 1. Use adhesive that has a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- I. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Wood Glues: 30 g/L.
  - 2. Contact Adhesive: 250 g/L.
- J. Adhesives: Use adhesives that 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."
- K. Adhesives: Adhesive for or site installation or factory fabrication. Submit manufacturer's documentation substantiating the following requirements for each type of materials provided per this specification.
- L. Submit manufacturer's certification that products comply with VOC limits when calculated according to 40CFR 59, Subpart D (EPA Method 24).
- M. Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.

- N. Submit Green Seal Certification to GS-36 and description of the basis of certification.
- O. Submit manufacturer's certification that products comply with SCAQMD #1168. Submit manufacturer's certification that products comply with SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions do exist or direct exposure to moisture can occur, submit manufacturer's certification that products comply with Bay Area AQMD Reg. 8, Rule 51 for containers larger than 16 oz with California Air Resources Board (CARB) for containers 16 oz or less.
- P. All cabinet work shall comply with California Standard 93120 with regard to formaldehyde levels.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.
- B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required.
- C. Examine surfaces for conditions that would prevent quality installation of millwork.
- D. Verify that grounds and blocking are in place to support millwork.
- E. Do not install on defective conditions, doing so shall indicate acceptance of site conditions and require you to correct any defects.

#### 3.2 INSTALLATION

- A. Do not start installation until the building is enclosed and the HVAC system controls the temperature and humidity (75 degrees, 55 RH) in the room space.
- B. Erect the cabinets plumb, level, true and straight with no distortions. Countertops shall be installed to within 1/8-inch of level in a 10-foot length.
- C. All cabinet faces shall be plumb and true from door face to door face. There shall be no side hanging or non-plumb doors. Seams shall be flush.
- D. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
- F. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
  - 1. Use filler matching finish of items being installed.

- G. Install cabinets without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
- H. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
- I. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
- J. Caulk all cabinets and countertops to adjacent wall surfaces.
- K. Accurately scribe and fit scribe strips, trim strips, and filler panels to irregularities of adjacent surfaces, maximum gap opening 0.025". Plastic laminate overlay trim shall not be used to close caps.
- L. Secure cabinets permanently to floor using anchors spaced at maximum of 30" o.c., minimum of two for each unit while maintaining 3/4" clearance between the back of cabinet and the exterior wall.
- M. Bolt adjoining cases together, maximum width of joints 1/32".
- N. Fasten tops to bases with screws driven through base cabinet top frame into bottom of countertop.
- O. Scribe all backsplashes and aprons and caulk.
- P. Blocking, Bucks, and Nailers: Install plumb, level and true with joints flush, fastened securely in place.
- Q. Furring and Stripping: Install plumb and level, shim to provide true finish surface.
- R. Install color-matched sealant at unfinished joints with other materials.
- S. Install wall-shelving standards on solid backing or with toggle bolts into steel studs or masonry or TEK screws into concrete.
  - 1. Do not install wall-shelving standards into gypsum wallboard only.
  - 2. Space standards as required to support indicated loading but not less than 5-plf based on shelf material provided.
- T. Do not install cabinetry or millwork closer than 24" to ceilings in fully sprinklered buildings or such that installation obstructs any fire sprinkler head.

### 3.3 SPECIAL INSTALLATION PROCEDURE / ADJUSTMENT PROCEDURES

- A. Provide all items and accessories as required for a total and complete installation in every respect.



- B. Proceed with installation only after unsatisfactory conditions have been corrected. Installation of any items indicates all conditions are satisfactory and acceptance of previous Work by other Contractors.
- C. Adjust cabinets and hardware so that doors and drawers operate smoothly.

#### 3.4 CLEANING

- A. All modular cabinet surfaces shall be cleaned of construction spoils, dirt, spills, dust and stains. The modular cabinet manufacturer shall recommend cleaning solvent. Clean all surfaces, edges and cabinet interiors.
- B. Remove and dispose of all packing materials and related construction debris.
- C. Protection: Protect casework from damage during construction until date of Substantial Completion, replace damaged work.

#### 3.5 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 06 41 16



## SECTION 06 45 60 – MANUFACTURED FOAM TRIM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Precast expanded polystyrene foam trim.

#### 1.3 REFERENCES

- A. ASTM C273 – Standard Test Method for Shear Properties of Sandwich Core Materials.
- B. ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- C. ASTM D256 – Determining the Pendulum Impact Resistance of Plastics.
- D. ASTM D570 – Water Absorption of Plastics.
- E. ASTM D638 – Tensile Properties of Plastics.
- F. ASTM D648 – Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
- G. ASTM D696 – Coefficient of Linear Thermal Expansion of Plastics Between - 30 degrees C and 30 degrees C with a vitreous Silica Dilatometer.
- H. ASTM D790 – Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- I. ASTM D792 – Density and Specific Gravity of Plastics by Displacement.
- J. ASTM D1623 – Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
- K. ASTM D2863 – Limited Oxygen Index.
- L. ASTM D5420 – Impact Resistance of Flat, Rigid Plastic Specimen by means of a Striker Impacted by a Falling Weight.
- M. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Submit copies of manufacturer's specifications and installation instructions for items required.
  - 1. Include data substantiating that materials comply with specified requirements.
  - 2. Indicate that installer has received copy of manufacturer's instructions.

- B. Shop Drawings: Submit shop drawings including materials and adhesive data, sections, elevations and anchorage details.
- C. Provide documentation from manufacturer and installer of having been in business continuously for the last five-years under the same company name.

#### 1.5 WARRANTY

- A. Warranty: Manufacturer shall warrant the product against defects in materials or workmanship and agrees to repair or replace components that fail within specified warranty period. The warranty period shall commence at the time of substantial completion and extend for a period of five (5) years.

### PART 2 - PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURER

- A. Manufacturer shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product.
  - 1. Foam Factory, Inc.

#### 2.2 MATERIAL

- A. Material: Closed cell expanded polystyrene cell foam with acrylic stucco hard coat consisting of two component 100% solids spray on coating. Density shall be 1.5 pounds per cubic foot with shade as indicated on drawings.
- B. Size and Shape: See drawings for sizes and shapes.
- C. Finish: Surface finish shall be manufacturer's standard sand finish as approved by the Architect.
- D. Flame spread: Provide treatment to produce a Flame spread rating 0-25.

#### 2.3 ADHESIVE

- A. Adhesive:
  - 1. PL Premium one-part urethane based adhesive as manufactured by PL Polyurethane Adhesives & Sealants or approved equal.
  - 2. Enerfoam polyurethane foam moisture cured as manufactured by Flexible Products Co. or approved equal.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

##### A. Site Verification of Conditions:

1. Prior to start of installation, inspect all preceding work to ensure that there are no conditions, which will cause an unsatisfactory installation of trim products. Notify Architect in writing of any unacceptable conditions.
2. Do not install any trim products until unsatisfactory conditions are corrected and acceptable for proper installation of work.

#### 3.2 PREPARATION

- ##### A. Protect surrounding and adjacent work to prevent damage to preceding work during execution of this work. Perform all preparation necessary for a successful installation of trim products as specified in manufacturer's installation instructions.

#### 3.3 INSTALLATION

- ##### A. Provide adhesive application per manufacturer's installation instructions.
- ##### B. Seam all joints and seams with sealant per manufacturer's installation instructions.

#### 3.4 PROTECTION

- ##### A. Install temporary protective materials necessary to prevent significant damage to materials installed in this work. Remove protection when required to permit project completion.

#### 3.5 OWNER'S INSTRUCTIONS

- ##### A. Follow manufacturer's instructions and recommendations on painting, repairing, and maintaining all material installed under this section.

END OF SECTION 06 45 60



## SECTION 07 14 16 – COLD FLUID-APPLIED WATERPROOFING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Cold applied waterproofing at retaining walls and as indicated.
    - b. Protection board.
    - c. Drainage panel.

#### 1.3 REFERENCES

- A. ASTM C836 – Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
- B. ASTM D412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
- C. ASTM D2240 – Standard Test Method for Rubber Property—Durometer Hardness.
- D. ASTM D2369 – Standard Test Method for Volatile Content of Coatings.
- E. ASTM E96/E96M – Standard Test Methods for Water Vapor Transmission of Materials.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Include construction details, material descriptions, and tested physical and performance properties of waterproofing. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Product Data: Submit manufacturer's printed product data and indicate location intended, application thickness, coverage, etc.
- B. Certification: Submit manufacturer's certification that material meets requirements as specified and required for use intended.
- C. Sample Warranties: For special warranties.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.

#### 1.7 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals and to set quality standards for installation.
- B. Build mockup for each typical waterproofing installation to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.
  - 1. Size: 100 sq. ft. in area.
- C. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- D. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.8 PREINSTALLATION MEETINGS

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
  - 1. Review waterproofing requirements including, but not limited to, the following:
    - a. Surface preparation.
    - b. Minimum curing period.
    - c. Forecasted weather conditions.
    - d. Special details and sheet flashings.
    - e. Repairs.

#### 1.9 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer.
- B. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
- C. Do not apply waterproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.
- D. Maintain adequate ventilation during application and curing of waterproofing materials.



#### 1.10 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace waterproofing that fails in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Ten (10) years from date of Substantial Completion.
- B. Installer's Special Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of two (2) years.
  - 1. Warranty includes removing and reinstalling membrane and protection board.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. W.R. Meadows
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Lambert Corp.
  - 2. Sonneborn Building Products

#### 2.2 WATERPROOFING

- A. Basis of Design: "Hydralastic 836"
- B. Material: Cold-applied, solvent free single-component, high solid content elastomeric waterproofing membrane conforming to ASTM C836.

#### 2.3 PROTECTION BOARD

- A. Protection Course: ASTM D 6506, Class B, 1/4" thick multi-ply semi-rigid sheets of mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners.

#### 2.4 DRAINAGE SYSTEM

- A. Panel: Composite geotextile filter fabrics with drainage core.
  - 1. Basis of Design: "Mel-Drain #5035"

- B. Drain: Two-part prefabricated geocomposite drain consisting of 24" tall core covered on one side with a non-woven, needle punched polypropylene filter fabric.
  - 1. Basis of Design: "Mel-Drain Total Drain"
  - 2. Drain Connector: Provide manufacturer's universal outlet fitting.

## 2.5 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended in writing by waterproofing manufacturer for intended use and compatible with waterproofing.
- B. Primer: Primer as recommended in writing by manufacturer.
- C. Patching Compound: Patching material of type recommended in writing by waterproofing manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
- C. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for proofing application.
- B. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, acid residues, and other penetrating contaminants or film-forming coatings from concrete.
- C. Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, holes, and other voids.
- D. Patch holes and voids with recommended patch material as recommended by manufacturer.
- E. Masonry unit surfaces to be treated shall be cleaned free of excess mortar, laitance, all loose particles and foreign material. Spots, efflorescence (mineral salt), and stains shall be removed using a 10% solution of muriatic acid. Oil and grease shall be removed with a suitable caustic solution or cleaning compound. After cleaning, surface shall be washed thoroughly with water to remove all traces of acid or cleaning solutions. All open joints, cracks larger than hairline, and holes shall be pointed with a suitable material matching surface.

### 3.3 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrate according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.
  - 1. Comply with ASTM C 1193 for joint-sealant installation.

### 3.4 WATERPROOFING INSTALLATION

- A. Apply materials in strict accordance with manufacturer's printed instructions. Do not dilute or otherwise change material from the original factory prepared solution. Material may be brush or spray-applied.
- B. Apply thickness of wet material as recommended by manufacturer using as many coats as necessary. Touch-up or re-coat any thin areas, pinholes, or breaks in material application.
- C. Waterproofing shall be continuous and monolithic to provide a continuous plane of protection and to patch voids.
- D. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
- E. Areas of the wall subject to extreme stress or movement shall be reinforced with a layer of fiber glass fabric embedded in the first coat prior to application of the second coat. Overlap all edges a minimum of 3" to form a continuous membrane reinforcement. Do not extend membrane across expansion joints.
- F. Where waterproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches over outside face of footing.
  - 1. Extend waterproofing 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when project is completed.
  - 2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where indicated as "reinforced," by embedding an 8-inch wide strip of asphalt-coated glass fabric in a heavy coat of waterproofing coat for embedding fabric is in addition to other coats.

### 3.5 PROTECTION BOARD INSTALLATION

- A. Install protection course with butted joints over waterproofing before starting subsequent construction operations.
- B. For horizontal applications, install protection course loose laid over fully cured membrane.
- C. For vertical applications, set protection course in nominally cured membrane, which will act as an adhesive. If membrane cures before application of protection course, use adhesive.
  - 1. Support protection course over cured coating with spot application of adhesive type recommended in writing by protection-board manufacturer.

2. Install protection course within 24 hours of installation of dampproofing and while coating is tacky to ensure adhesion.

### 3.6 INSTALLATION OF DRAINAGE SYSTEM

- A. Place and secure drainage panels according to manufacturer's written instructions. Use adhesives or other methods that do not penetrate dampproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction. Connect drain to underground drainage system with minimum 4" diameter drain pipe and connect to nearest drainage structure.

### 3.7 CLEANING

- A. During application, immediately clean waterproofing from adjacent surfaces or other areas not specified to receive materials.
- B. Maintain work area clean and free of excess waste, empty containers, faulty materials, etc. Immediately remove defective materials from job site.
- C. Provide final cleaning of area and treated surfaces before acceptance. Remove all materials not applied and leave area clean and ready for next trade or Owner's use.
- D. Repair or replace any surface damaged by improper application, over-spray, or other condition to first class originally specified condition and at no additional cost to the Owner.

END OF SECTION 07 14 16

## SECTION 07 19 00 – WATER REPELLENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Masonry and concrete water repellents.

#### 1.3 REFERENCES

- A. ASTM C1195 – Standard Test Method for Repetitive Static Plate Load Tests of Soils and Flexible Pavement Components, for Use in Evaluation and Design of Airport and Highway Pavements.
- B. ASTM D1653 – Standard Test Methods for Water Vapor Transmission of Organic Coating Films.
- C. ASTM D5095 – Standard Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments.
- D. ASTM D6490 – Standard Test Method for Water Vapor Transmission of NonFilm Forming Treatments Used on Cementitious Panels.
- E. ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.
- F. ASTM E1857 – Standard Guide for Selection of Cleaning Techniques for Masonry, Concrete, and Stucco Surfaces.
- G. ASTM G154 – Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Product specifications, materials characteristics, performance criteria, limitations installation instructions and certified product test results.
  - 1. Include manufacturer's printed statement of VOC content.
  - 2. Include printout of current "MPI Approved Products List" for each product category specified in Part 2 that specifies water repellents approved by MPI, with the proposed product highlighted.

- B. Samples: For type of water repellent and substrate indicated, 12 by 12 inches in size, with specified water-repellent treatment applied to half of each Sample.
- C. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of water repellent.
- B. Preconstruction Test Reports: For water-repellent-treated substrates.
- C. Field quality-control reports.
- D. Sample Warranty: For special warranty.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- C. Applicator Qualifications: An employer of workers trained and approved by manufacturer.
- D. MPI Standards: Comply with MPI standards indicated and provide water repellents listed in its "MPI Approved Products List."

#### 1.7 FIELD CONDITIONS

- A. Limitations: Proceed with application only when the following existing and forecasted weather and substrate conditions permit water repellents to be applied according to manufacturers' written instructions and warranty requirements:
  - 1. Surfaces and mortar have cured for not less than 28 days.

2. Building has been closed in for not less than 30 days before treating wall assemblies.
3. Ambient temperature is above 40 deg F and below 100 deg F and will remain so for 24 hours.
4. Substrate is not frozen and substrate-surface temperature is above 40 deg F and below 100 deg F.
5. Rain is not predicted within 24 hours.
6. Not less than seven days have passed since surfaces were last wet.
7. Windy conditions do not exist that might cause water repellent to be blown onto vegetation or surfaces not intended to be treated.

#### 1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which [manufacturer] [and] [Applicator] agree(s) to repair or replace materials that fail to maintain water repellency specified in "Performance Requirements" Article within specified warranty period.

1. Warranty Period: Two (2) years from date of Substantial Completion.

#### 1.9 PERFORMANCE REQUIREMENTS

- A. Performance: Water repellents shall meet the following performance requirements as determined by testing on manufacturer's standard substrates representing those indicated for this Project.
- B. Water Absorption: Minimum 90 percent reduction of water absorption after 24 hours for treated compared to untreated specimens when tested according to the following:
1. Cast Stone: ASTM C 1195.
- C. Water-Vapor Transmission: Comply with one or both of the following:
1. Maximum 10 percent reduction water-vapor transmission of treated compared to untreated specimens, according to ASTM E 96/E 96M.
  2. Minimum 80 percent water-vapor transmission of treated compared to untreated specimens, according to ASTM D 1653.
- D. Durability: Maximum 5 percent loss of water-repellent performance after 2500 hours of weathering according to ASTM G 154 compared to water-repellent-treated specimens before weathering.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER'S

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the architect in writing prior to bidding.

1. Prosoco

B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.

1. BASF
2. Advanced Chemical Technologies

## 2.2 MASONRY AND CONCRETE PENETRATING WATER REPELLENTS

A. Silane, Penetrating Water Repellent: Clear, containing 20 percent or more solids of alkyltrialkoxysilanes; with alcohol, mineral spirits or other proprietary solvent carrier; and with 600 g/L or less of VOCs.

B. Basis of Design: "SL-100"

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements and conditions affecting performance of the Work.
- B. Verify that surfaces are clean and dry according to water-repellent manufacturer's requirements. Check moisture content in three representative locations by method recommended by manufacturer.
- C. Verify that there is no efflorescence or other removable residues that would be trapped beneath the application of water repellent.
- D. Substrate must be clean, sound, and free of surface contaminants. Remove dust, laitance, grease, oils, curing compounds, form release agents and all foreign particles by mechanical means. Substrate shall be in accordance with ICRI Guideline No. 03732 for sealers.
- E. Test pH level according to water-repellent manufacturer's written instructions to ensure chemical bond to silica-containing or siliceous minerals.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Allow cementitious materials to age before application of water repellent, according to repellent manufacturer's written instructions.
- B. Cleaning: Before application of water repellent, clean substrate of substances that could impair penetration or performance of product according to water-repellent manufacturer's written instructions and remove oil, curing compounds, laitance, and other substances that inhibit penetration or performance of water repellents according to ASTM E 1857.



- C. Protect adjoining work, including mortar and sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of water repellent being deposited on surfaces. Cover live vegetation.
- D. Coordination with Mortar Joints: Do not apply water repellent until pointing mortar for joints adjacent to surfaces receiving water-repellent treatment has been installed and cured.
- E. Coordination with Sealant Joints: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.
  - 1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those required.

### 3.3 APPLICATION

- A. Apply coating of water repellent on surfaces to be treated using a fan-type spray nozzle to the point of saturation. Apply coating in dual passes of uniform, overlapping strokes. Remove excess material; do not allow material to puddle beyond saturation. Comply with manufacturer's written instructions for application procedure unless otherwise indicated.
- B. Apply a second saturation coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

### 3.4 FIELD QUALITY CONTROL

- A. Testing of Water-Repellent Material: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when water repellent is being applied:
  - 1. Owner will engage the services of a qualified testing agency to sample water-repellent material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
  - 2. Testing agency will perform tests for compliance of water-repellent material with product requirements.
  - 3. Owner may direct Contractor to stop applying water repellents if test results show material being used does not comply with product requirements. Contractor shall remove noncomplying material from Project site, pay for testing, and correct deficiency of surfaces treated with rejected materials, as approved by Architect.
- B. Coverage Test: In the presence of Architect, hose down a dry, repellent-treated surface to verify complete and uniform product application. A change in surface color will indicate incomplete application.
  - 1. Notify Architect seven (7) days in advance of the dates and times when surfaces will be tested.
  - 2. Reapply water repellent until coverage test indicates complete coverage.

3.5 CLEANING

- A. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Correct damage to work of other trades caused by water-repellent application, as approved by Architect.
- B. Comply with manufacturer's written cleaning instructions.

END OF SECTION 07 19 00

## SECTION 07 21 00 – THERMAL INSULATION

### PART I - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Polyisocyanurate foam-plastic board.
  - b. Glass-fiber batt.

#### 1.3 REFERENCES

- A. ASTM C209 – Standard Test Methods for Cellulosic Fiber Insulating Board.
- B. ASTM C236 – Standard Test Method for Steady-State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box.
- C. ASTM C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- D. ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
- E. ASTM C1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Insulation Board (polyis).
- F. ASTM E96 – Test Method for Water Vapor Transmission of Material.
- G. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- H. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials.
- I. ASTM E136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750o C.
- J. UL 723 – Test for Surface Burning.
- K. NFPA 255 – Test of Surface Burning Characteristics of Building Materials.
- L. FBC – Florida Building Code.
- M. ASHRAE Handbook.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated including performance.
- B. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.

2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- C. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- B. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention; cautionary procedures required during application.
- C. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

#### 1.6 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.

#### 1.7 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. Insulation Protection: Do not expose to sunlight except to necessary extent for period of installation and concealment. Protect against ignition at all times and do not deliver materials to project site before installation time.

1.8 WARRANTY

- A. Provide written warranty from the manufacturer that the actual thermal resistance of the extruded polystyrene insulation will not vary by more than 10% from its published thermal resistance.
- B. Warranty period is fifteen (15) years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer shall be one of the following in each category however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.

- 1. CertainTeed Corporation
- 2. Johns Manville
- 3. Owens Corning
- 4. Knauf Insulation
- 5. Dow Chemical Co.
- 6. Atlas Roofing Corp.

2.2 POLYISOCYANURATE FOAM-PLASTIC BOARD

- A. Basis of Design: "CGF Pro" as manufactured by Atlas Roofing Corp.
- B. Glass-Mat-Faced Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84, Class A.
  - 1. Minimum R-Value: 6 per inch of thickness.
  - 2. Thickness: Total thickness shall be 1-1/2" and as indicated on drawings.

2.3 POLYISOCYANURATE FOAM-PLASTIC BOARD

- A. Basis of Design: "Thermax Sheathing" as manufactured by Dow Chemical Co.
- B. Foil Faced Polyisocyanurate Foam-Plastic Board: Foil faced, ASTM C1289, Type I, Class 2 with maximum flame-spread of 25 and smoke-developed indexes of 185, respectively, per ASTM E 84.
  - 1. Minimum R-Value: 6.5 per inch of thickness.
  - 2. Thickness: Total thickness shall be 1-1/2" and as indicated on drawings
- C. Provide in areas where insulation is exposed to ceiling cavities, etc. and as indicated on drawings.

2.4 GLASS-FIBER BATT

- A. Unfaced Glass-Fiber Batt: Unfaced, ASTM C665, Type I, with maximum flame-spread of 25 and smoke-developed indexes of 50, respectively, per ASTM E 84.
1. Thickness: Total thickness shall be 5-1/2" and as indicated on drawings.

2.5 LOOSE FILL FIBERGLASS

- A. Loose Fill Fiberglass: Fiberglass, ASTM C764, Type I, Class 1 with maximum flame-spread of 25 and smoke-developed indexes of 50, respectively, per ASTM E 84.
1. Loose fill density: 1.3 – 1.5 lbs.cu. ft.
  2. Thickness: Total thickness to be 6" (R-19) at indicated locations and other thicknesses and locations as indicated.

2.6 ACCESSORIES

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.
1. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
  2. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.
  3. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.
  4. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates as recommended by insulation manufacturer.
- B. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
- C. Insulation for Miscellaneous Voids: Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.

2.7 ENVIRONMENTAL

- A. Biobased Products: Indicate type of biobased material in product and indicate the percentage of biobased content per unit of product. Indicate relative dollar value of biobased content product to total dollar value of product included in project.
- B. Recycled Content: Provide acoustical panels with recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content constitutes a minimum of 20 percent by weight.
- C. Adhesives: For adhesives, sealants and chemical-bonding compounds, including printed statement of VOC content.

- D. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
- E. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders, 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 rain at any time.
- C. Extend insulation to envelop entire building 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 INSULATION ON INTERIOR FACE OF EXTERIOR WALL

- A. Board Insulation: Install spindle-type anchors spaced as recommended by manufacturer. Fit insulation tight to obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

### 3.4 INSTALLATION OF BATT INSULATION IN FRAMED CONSTRUCTION

- A. Batt Insulation: Install in cavities formed by framing members and where indicated according to the following requirements:
  - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
  - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation.

3.5 PROTECTION

- A. Protect installed insulation 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.

3.6 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 07 21 00



## SECTION 07 21 19 – FOAMED IN PLACE INSULATION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Open cell foamed in place insulation.

#### 1.3 REFERENCES

- A. ASTM E96 – Test Method for Water Vapor Transmission of Materials.
- B. ASTM C665 – Standard Specification for Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
- C. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM E136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 °C.
- E. ASTM C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- F. ASTM C423 – Standard Test Method for Sound Absorption Coefficient by the Reverberation Room Method.
- G. NFPA 255 – Test of Surface Burning Characteristics of Building Materials.
- H. UL 723 – Test for Surface Burning.
- I. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicating performance.
- B. Manufacturer's Certification: Certify that products meet or exceed specified requirements.

#### 1.5 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 and ASTM E119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect 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.

1.7 WARRANTY

- A. Provide manufacturer's commercial lifetime limited warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Product: Subject to compliance with requirements provide the following manufacturer.
  - 1. Icynene
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. BASF Corp.
  - 2. Bayer Material Science (BKY Systems)

2.2 MATERIALS

- A. Basis of Design: Icynene "Classic Max"
- B. Open-Cell Spray Polyurethane Foam: Spray-applied polyurethane foam using water as a blowing agent. Minimum density of 0.5 lb./cu. ft. and minimum aged R-value at 1-inch thickness of 3.7 deg. F. x h x sq. ft./Btu at 75 deg. F

2.3 PERFORMANCE CHARACTERISTICS

- A. Air Material Performance (for 3 inches of material)  $<0.014 \text{ L/S M}^2 @ 75 \text{ Pa}$  per ASTM E 2178.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency
  - 1. Flame-Spread Index: 20.
  - 2. Smoke-Development Index: 340.
- C. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
- D. Compressive strength: Minimum 40 psi (276 kPa) (ASTM C1029 Type II).
- E. Sustainability Requirements: Provide spray polyurethane foam insulation as follows:

1. Low Emitting: Insulation tested according to CA/DPH/EHLB/v1.1-2010.
2. Resistant to fungal growth as per ASTM C1338.
3. Containing no PBDE.

## 2.4 ACCESSORIES

- A. Primer: Material recommended by insulation manufacturer where required for adhesion of insulation to substrates.
- B. Fire Protective Coating: Protective coating "DC-315" as manufactured by International Fireproof Technology, Inc. in color white.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Verify that substrates are clean, dry, and free of substances that are harmful to insulation.
- B. Priming: Prime substrates where recommended by insulation manufacturer. Apply primer to comply with insulation manufacturer's written instructions. Confine primers to areas to be insulated; do not allow spillage or migration onto adjoining surfaces.

### 3.2 INSTALLATION

- A. Comply with insulation manufacturer's written instructions applicable to products and applications
- B. Spray insulation to envelop entire area to be insulated and fill voids.
- C. Apply in multiple passes to not exceed maximum thicknesses recommended by manufacturer. Do not spray into rising foam.
- D. Do not apply insulation within 3-inches of heat emitting devices or where the temperature is in excess of 200 degrees F , as per ASTM C411 or in accordance with applicable codes.
- E. Framed Construction: Install into cavities formed by framing members to achieve thickness indicated on drawings.
- F. Miscellaneous Voids: Apply according to manufacturer's written instructions
- G. Apply fire protective coating per manufacturer's instructions. Apply at a minimum thickness of 20 wet mils.

### 3.3 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Thermal Protection: Protect installed spray polyurethane foam insulation with qualified thermal or ignition barrier per applicable building codes.

3.4 INSTALLATION OF AIR BARRIER COMPONENTS

- A. Install air barrier components – membranes and sealants – as indicated on drawings for spray polyurethane foam as part of an air barrier system.

END OF SECTION 07 21 19

## SECTION 07 26 00 – VAPOR RETARDERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Vapor retarder for building concrete slabs on grade.

#### 1.3 REFERENCES

- A. 2001 ASHRAE Fundamentals Handbook: CHAPTER 25.
- B. ASTM C920 – Standard Specification for Elastomeric Joint Sealant.
- C. ASTM D882 – Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
- D. ASTM D1709 – Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
- E. ASTM E96 – Test Methods for Water Vapor Transmission of Materials.
- F. ASTM E154 – Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
- G. ASTM F1249 – Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.
- H. ASTM E1643 – Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- I. ASTM E1745 – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
- J. SWRI (Sealant, Waterproofing and Restoration Institute) – Sealant and Caulking Guide Specification.
- K. FBC – Florida Building Code.
- L. ACI 302.IR – Guide for Concrete Floor & Slab.
- M. ACI 302.2IR – Guide for Concrete Slabs that Receive Moisture Sensitive Flooring Materials.
- N. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Provide data indicating material characteristics, performance criteria, and limitations.
- B. Provide the manufacturer's installation instructions indicating preparation and installation requirements techniques per ASTM E 1643.

1.5 INFORMATIONAL SUBMITTALS

- A. Independent laboratory test results showing compliance with ASTM & ACI Standards.
- B. Manufacturer's samples, literature.
- C. Manufacturer's installation instructions for placement, seaming and pipe boot installation.
- D. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with SWRI - Sealant and Caulking Guide Specification requirements for materials and installation.
- B. Maintain one copy of each document on site.

1.7 WARRANTY

- A. Warranty: (a) compliance with the designated ASTM E1745 classification, and (b) no manufacturing defects in the product for, at least, the Life of the Building.

1.8 PERFORMANCE REQUIREMENTS

- A. Water Vapor Transmission Rate: Maximum as indicated per ASTM E96 or ASTM F1249.
- B. Minimum ASTM E1745 Class A rating for slabs on grade.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Stego Industries
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Moistop
  - 2. Griffolyn

2.2 SHEET MATERIALS

- A. Below Grade Sheet Retarder (Building slabs on grade) shall have the following properties:

1. Basis of Design: "Stego Vapor Barrier"
2. Polyethylene film, 15-mil thick, and perm rating of 0.01 perms or lower (gr/ft<sup>2</sup>/hr/in-HG).
3. Permeance Rating: Per ASTM E96 or ASTM F1249. Material shall meet permeance requirement for both new material and after ASTM E1745 mandatory condition test sections 7.1 (7.1.1-7.1.5).
4. Water Vapor Retarder: Meet or exceed Class A per ASTM E1795.
5. The manufacturer's name shall be printed on the material or documentation shall be provided attesting that the installed material complies with the product submitted and approved by the Architect.

### 2.3 ACCESSORIES

- A. Thinner and Cleaner for Sheet: As recommended by sheet material manufacturer.
- B. Sealant: As recommended by sheet material manufacturer.
- C. Adhesive: As recommended by sheet material manufacturer.
- D. Tape shall be as required by the manufacturer of the vapor retarder with a maximum water vapor transmission rate of .03 perms (ASTM E 96).
- E. Perimeter Tape: Manufacturer's textured tape.
- F. Termination Bar: Manufacturer's termination bar.
- G. Double Sided Tape: Manufacture's double-sided tape.
- H. Screed System: Manufacturer's standard screed system.
- I. Optional construction pipe booth from vapor barrier material applied per manufacturer's requirements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Prior to installing vapor barriers, inspect fill areas for sharp objects or other items that might puncture the material. Remove such objects before placing membrane.
- B. Inspect installed vapor barriers and joint fillers for proper placement, levelness, etc. prior to placement of concrete. Patch all penetrations, tears, rips and joints in vapor barriers and adjust joint filler for proper height, location and material thickness.

### 3.2 PREPARATION

- A. Remove loose or foreign matter that might impair adhesion.
- B. Clean and prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

### 3.3 INSTALLATION

- A. Vapor barrier shall be installed in accordance with ASTM E1643 and per manufacturer's specifications, free of air pockets and wrinkles.
- B. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
- C. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, water stops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
  - 1. Sealing to a slab: Seal vapor barrier to the entire slab perimeter using manufacturer's textured tape with a surface that creates a mechanical seal to freshly-placed concrete, per manufacturer's instructions.
  - 2. Sealing to a stem wall: Seal vapor barrier to the entire perimeter wall or footing/grade beam with manufacturer's double-sided tape, or both termination bar and double-sided tape, per manufacturer's instructions. Ensure the concrete is clean and dry prior to adhering tape.
- D. All laps shall be continuously sealed according to manufacturer's recommendations with a full adhesive bed at the seam or lap joints 6" and fully seal with tape. Apply seam tape/textured tape/double-sided tape to a clean and dry vapor barrier.
- E. Install joint filler of thickness shown on Plans, along all concrete slab on fill intersections with walls, columns, or other structural elements unless otherwise shown. Use 1/2" thickness unless otherwise noted. Hold material down approximately 1/4" below floor slab surface.
- F. Seal all penetrations (including pipes) per manufacturer's requirements with tape to restore barrier integrity.
- G. Avoid the use of stakes driven through vapor barrier by utilizing screed and forming systems that will not leave punctures in the vapor barrier.
- H. Repair any damaged areas by cutting patches of vapor retarder material, overlapping damaged area at least 6" into undamaged material and taping all sides.
- I. Seal all joints after concrete has properly cured, flush with surface of concrete. Verify compatibility of sealant with any planned flooring adhesive, sealer, or other materials in contact with the sealant.

### 3.4 CLEANING

- A. After installation, clean all surfaces and adjacent work area of excess material, waste, debris, etc.

END OF SECTION 07 26 00



## SECTION 073113 – ASPHALT SHINGLES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Asphalt shingles.
    - b. Underlayment.
    - c. Metal flashing and trim.

#### 1.3 REFERENCES

- A. ANSI/UL 790.
- B. UL 977.
- C. UL 2218.
- D. ASTM C1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
- E. ASTM D3018/D3018M – Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
- F. ASTM D3161/D3161M – Standard Test Method for Wind-Resistance of Steep Slope Roofing Products (Fan-Induced Method).
- G. ASTM D3462/D4362M – Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
- H. ASTM D7158/D7158M – Standard Test Method for Wind Resistance of Asphalt Shingles (Uplift Force/Uplift Resistance Method).
- I. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- J. ASTM E108 – Standard Test Methods for Fire Tests of Roof Coverings.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.
  - 1. Asphalt Shingles: Full size.
  - 2. Ridge Vent: 12-inch-long Sample.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each type of asphalt shingle and underlayment product indicated, for tests performed by a qualified testing agency.
- C. Evaluation Reports: For self-adhering sheet underlayment, from ICC-ES or other testing and inspecting agency acceptable to authorities having jurisdiction, indicating that product is suitable for intended use under applicable building codes.
- D. Sample Warranty: For manufacturer's warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For asphalt shingles to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Asphalt Shingles: 100 sq. ft. of each type, in unbroken bundles.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.
- B. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
- C. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.
- D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

## 1.11 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Manufacturing defects.
  - 2. Material Warranty Period: Silver Pledge Warranty forty (40) years from date of Substantial Completion.
  - 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds as indicated on Structural Plans five (5) years from date of Substantial Completion.
  - 4. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for five (5) years from date of Substantial Completion.
  - 5. Workmanship Warranty Period: Two (2) years from date of Substantial Completion.
- B. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of asphalt-shingle roofing that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Two (2) years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

### 2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D 3462/D 3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, self-sealing and shingles shall be Class A and comply with ANSI/UL 790.
  - 1. Basis of Design: Match existing.
  - 2. Butt Edge: Match existing.
  - 3. Strip Size: Match existing.
  - 4. Algae Resistance: Granules resist algae discoloration.
  - 5. Impact Resistance: UL 2218, Class 4.
  - 6. Color and Blends: Match existing.

### 2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering Sheet Underlayment Polyethylene Faced: ASTM D 1970/D 1970M, minimum of 40-mil- thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release backing; cold applied.

1. Basis of Design: "Ice and Water Shield" as manufactured by GCP Applied Technologies, Inc.
2. Underlayment shall comply with ASTM E108 and UL 790 Class A Classification under fiberglass shingles.

#### 2.4 NAILABLE INSULATION

- A. Composite polyisocyanurate insulation board bonded to 19/32" CDX plywood on top face.
1. Basis of Design: "ACFoam CrossVent" as manufactured by Atlas Roofing Corporation.
  2. Thickness: As indicated on the drawings.
  3. Insulation shall comply with ASTM E108 and UL 790 Class A classification under fiberglass shingles.

#### 2.5 RIDGE VENTS

- A. Rigid Ridge Vent: Manufacturer's standard, rigid section metal ridge vent for use under ridge shingles.
1. Nonwoven geotextile filter strips.
  2. External deflector baffles.

#### 2.6 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch-diameter, sharp-pointed, with a minimum 3/8-inch-diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.
1. Shank: Barbed.
  2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

#### 2.7 METAL FLASHING AND TRIM

- A. General: Comply with type and finish requirements in specification section "Sheet Metal Flashing and Trim."
1. Sheet Metal: Aluminum.
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.
- C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least 4 inches from pipe onto roof.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
  - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provisions have been made for flashings and penetrations through asphalt shingles.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSULATION INSTALLATION

- A. Install specified insulation using approved method in accordance with manufacturer's latest written instructions and as required by governing codes.
- B. Install with end joints staggered to avoid having insulation joints coinciding with joints in deck. In multi-layer installations, stagger joints in top and bottom layers.

#### 3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.
  - 1. Eaves: Extend from edges of eaves 24 inches beyond interior face of exterior wall.
  - 2. Rakes: Extend from edges of rake 24 inches beyond interior face of exterior wall.
  - 3. Valleys: Extend from lowest to highest point 18 inches on each side.
  - 4. Hips: Extend 18 inches on each side.
  - 5. Ridges: Extend 36 inches on each side without obstructing continuous ridge vent slot.
  - 6. Sidewalls: Extend beyond sidewall 18 inches and return vertically against sidewall not less than 4 inches.
  - 7. Dormers, Chimneys, Skylights, and Other Roof-Penetrating Elements: Extend beyond penetrating element 18 inches and return vertically against penetrating element not less than 4 inches.
  - 8. Roof Slope Transitions: Extend 18 inches on each roof slope.
- B. Metal-Flushed, Open-Valley Underlayment: Install two layers of minimum 36-inch-wide underlayment centered in valley. Stagger end laps between layers at least 72 inches. Lap ends of each layer at least 12 inches in direction to shed water, and seal with asphalt roofing cement. Fasten each layer to roof deck.

1. Lap roof-deck underlayment over first layer of valley underlayment at least 6 inches.

### 3.4 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Specification Section "Sheet Metal Flashing and Trim."
  1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.
- C. Step Flashings: Install with a headlap of 2 inches and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.
- D. Cricket or Backer Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.
- E. Open-Valley Flashings: Install centered in valleys, lapping ends at least 8 inches in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.
  1. Secure hemmed flange edges into metal cleats spaced 12 inches apart and fastened to roof deck.
  2. Adhere 9-inch-wide strip of self-adhering sheet to metal flanges and to self-adhering sheet underlayment.
- F. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.
- G. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.
- H. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

### 3.5 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip with self-sealing strip face up at roof edge.
  1. Extend asphalt shingles 1/2 inch over fasciae at eaves and rakes.
  2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

- D. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.
- E. Fasten asphalt-shingle strips per Florida Product Approval with roofing nails located according to manufacturer's written instructions.
  - 1. Where roof slope exceeds 21:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
  - 2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
  - 3. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.
- F. Woven Valleys: Extend succeeding asphalt-shingle courses from both sides of valley 12 inches beyond center of valley, weaving intersecting shingle-strip courses over each other. Use one-piece shingle strips without joints in valley.
  - 1. Do not nail asphalt shingles within 6 inches of valley center.
- G. Closed-Cut Valleys: Extend asphalt-shingle strips from one side of valley 12 inches beyond center of valley. Use one-piece shingle strips without joints in valley. Fasten with extra nail in upper end of shingle. Install asphalt-shingle courses from other side of valley and cut back to a straight line 2 inches short of valley centerline. Trim upper concealed corners of cut-back shingle strips.
  - 1. Do not nail asphalt shingles within 6 inches of valley center.
  - 2. Set trimmed, concealed-corner asphalt shingles in a 3-inch-wide bed of asphalt roofing cement.
- H. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Maintain uniform width of exposed open valley.
  - 1. Set valley edge of asphalt shingles in a 3-inch-wide bed of asphalt roofing cement.
  - 2. Do not nail asphalt shingles to metal open-valley flashings.
- I. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
- J. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
  - 1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

### 3.6 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("the work") on the following project:
  - 1. Owner: <Insert name of Owner>.
  - 2. Address: <Insert address>.

3. Building Name/Type: <Insert information>.
  4. Address: <Insert address>.
  5. Area of the Work: <Insert information>.
  6. Acceptance Date: <Insert date>.
  7. Warranty Period: <Insert time>.
  8. Expiration Date: <Insert date>.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant the work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of the work as are necessary to correct faulty and defective work and as are necessary to maintain the work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to the work and other parts of the building, and to building contents, caused by:
    - a. Lightning;
    - b. Peak gust wind speed exceeding <Insert wind speed> mph;
    - c. Fire;
    - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    - e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    - f. Vapor condensation on bottom of roofing; and
    - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
  2. When the work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  3. Roofing Installer is responsible for damage to the work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of the work.
  4. During Warranty Period, if Owner allows alteration of the work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of the alterations, but only to the extent the alterations affect the work covered by this Warranty. If Owner engages Roofing Installer to perform the alterations, Warranty shall not become null and void unless Roofing Installer, before starting the alterations, notified Owner in writing, showing reasonable cause for claim, that the alterations would likely damage or deteriorate the work, thereby reasonably justifying a limitation or termination of this Warranty.
  5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a use or service more severe than originally specified, this Warranty shall become null and void on date of the change, but only to the extent the change affects the work covered by this Warranty.
  6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect the work and to examine evidence of such leaks, defects, or deterioration.



7. This Warranty is recognized to be the only warranty of Roofing Installer on the work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of the work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.

1. Authorized Signature: <Insert signature>.
2. Name: <Insert name>.
3. Title: <Insert title>.

END OF SECTION 07 31 13



## SECTION 07 42 15 – FORMED METAL CEILING AND WALL PANELS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Provide labor, materials, and equipment necessary for providing the preformed metal roofing and related Work as indicated and required for a complete and watertight installation.
- B. Items provided under this Section includes, but is not limited to:
  - 1. Formed metal wall and fascia panels.
  - 2. Formed metal ceiling panels.
  - 3. Flashings, closures, and trim.

#### 1.3 REFERENCES

- A. ASTM E 283 – Rate of Leakage through Exterior Windows, Curtain Walls, and Doors.
- B. ASTM E 84 – Surface Burning Characteristics of Building Materials.
- C. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM E283 – Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- E. ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- F. ASTM E331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- G. AAMA 508 – Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.
- H. AAMA 509 – Voluntary Test and Classification Method for Drained and Back Ventilated Rain Screen Wall Cladding Systems.
- I. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- J. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- K. NAAMM Metal Finishes Manual for Architectural and Metal Products.
- L. SMACNA Sheet Metal and Air Conditioning Contractors National Association.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Include manufacturer's product specifications, standard details, certified product test results, and general recommendations, as applicable to materials and finishes for each component and for total panel assemblies.

- B. Shop drawings shall show layout, elevations, profile and gauge of items, location and type of joints and fasteners; location, gauge, shape, and method of attachment of trim; and other details as may be required for wall system weathertight installation.
  - 1. Shop drawings shall be prepared by metal panel manufacturer and signed and sealed by an Engineer registered in the State of Florida. Contractor prepared shop drawings are not acceptable.
- C. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 3" = 1'-0" (1:5).
- D. Submit manufacturer's complete standard color samples, as part of the submittal package.
  - 1. Submit two samples, 12 inch square, of exposed finish material, all roof fastening accessories, of selected color.
- E. Delegated-Design Submittal: Submit design calculations, analysis data and shop drawings indicating compliance with dedicated design requirements signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.
- F. Approvals: Manufacturer submit documentation that product complies with large and small missile impact criteria and have been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.
- G. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- H. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and Manufacturer.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.

1.7 MOCKUPS

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
- B. Build mockup of typical metal panel assembly as shown on Drawings, including corner, supports, attachments, and accessories.
- C. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.
- D. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- E. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PREINSTALLATION MEETINGS

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
- B. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
- C. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

- D. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
- C. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
- F. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
- G. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
- H. Review temporary protection requirements for metal panel assembly during and after installation.
- I. Review of procedures for repair of metal panels damaged after installation.
- J. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver panels to jobsite properly packaged to provide against transportation damage.
- B. Handling: Exercise extreme care in unloading, storing, and erecting panels to prevent banding, warping, twisting, and surface damage.
- C. Storage: Store materials and accessories above ground on well skidded platforms. Store under waterproof covering. Provide proper ventilation to panels to prevent condensation build-up between panels.

#### 1.10 FIELD CONDITIONS

- A. Field Measurements: Verify location of structural members and openings in substrates by field measurements before fabrication and indicate measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying work.
- B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of ceilings, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

#### 1.11 WARRANTY

- A. The Manufacturer shall furnish the following warranties for materials and finishes:
  - 1. Exterior metal cladding system Manufacturer's five (5) year warranty against defective materials and fabrication.
  - 2. Exterior metal cladding system Manufacturer's thirty (30) year warranty for performance of prefinished finishes. The finish warranty shall provide coverage for the following:
    - a. Fade Resistance: For first exposure to UV or weathering, the post-painted material finishes shall exhibit no more than a 5 "delta E" rating for color change from original color standard.

- b. Chalk Resistance: For first exposure to UV or weathering, the post-painted material finishes shall exhibit a chalk rating of 8 or less, in accordance with ASTM D4214, Method A.
- c. Film Integrity: For first exposure to UV or weathering, the post-painted material finishes shall not chip, peel, crack, or blister as a result of defective coatings, improper preparation of the substrate, improper application of the coatings, or improper curing of the coating system.

- B. Installer's three (3) year warranty covering wall panel system installation and watertightness.
- C. Warranties shall commence on date of substantial completion.

#### 1.12 PERFORMANCE

- A. General Performance: Metal wall panel assemblies shall be furnished and installed without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Thermal Expansion and Contraction.
  - 1. Completed metal wall panel and flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, or reducing performance ability.
  - 2. The design temperature differential shall be not less than 220 degrees Fahrenheit.
  - 3. Interface between panel and clip shall provide for unlimited thermal movement in each direction along the longitudinal direction.
- C. Wind Load
  - 1. Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 20 lb/ft<sup>2</sup> (959 N/m<sup>2</sup>) and 30 lb/ft<sup>2</sup> (1438 N/m<sup>2</sup>) on parapet and corner panels. Wind load testing shall be conducted in accordance with ASTM E 330 to obtain the following results.
  - 2. Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed L/175 or 3/4", whichever is less.
  - 3. Normal to the plane of the wall, the maximum panel deflection shall not exceed L/60 of the full span.
  - 4. Maximum anchor deflection shall not exceed 1/16".
  - 5. At 1-1/2 times design pressure, permanent deflections of framing members shall not exceed L/100 of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed 1/16".
- D. Air/Water System Test
  - 1. If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:
  - 2. Air Infiltration - When tested in accordance with ASTM E 283, air infiltration at 1.57 lb/ft<sup>2</sup> must not exceed 0.06 ft<sup>3</sup>/min. per ft<sup>2</sup> of wall area (305 cm<sup>3</sup>/s per m<sup>2</sup> of wall area).

3. Water Infiltration - Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated Systems) shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 lb/ft<sup>2</sup> after 15 minutes of exposure in accordance with ASTM E 331.
  4. Pressure Equalized Rain Screen Systems shall comply with AAMA 508-05 Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.
- E. Fire Performance: Panels shall meet maximum flame spread 25, maximum smoke developed 450.
- F. Delegated-Design: Provide delegated design services including calculations and shop drawings for load bearing items to comply with performance requirements, applicable code requirements and design criteria signed and sealed by an engineer registered in the State of Florida.
- G. Approvals: Manufacturer shall certify that product complies with large and small missile impact criteria and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the architect in writing prior to bidding.
1. 3A Composites USA, Inc.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
1. Peterson Aluminum
  2. MBCI Building Systems Co.

### 2.2 METAL WALL PANELS

- A. Basis of Design: "ALUCOBOND Plus"
1. Florida Product Approval: #FL-26505.4
- B. Panel: Composite comprised of two (2) aluminum face sheets bonded with fire core.
- C. Thickness: 0.157"
1. Exterior and Interior Face Sheets: Aluminum AA3000 Series Alloy 0.020" nominal thickness
  2. Core: Proprietary fire-resistant core 0.117" nominal thickness
- D. Panel Size: See drawings.
- E. Panel Weight: 1.58 lb/ft<sup>2</sup>



- F. Texture: Smooth, verify with Architect.
- G. Mounting: Manufacturer's extruded interlocking clips.
- H. Panel Stiffener: Manufacturer's extruded stiffener clip system.

## 2.3 SYSTEM TYPE

### A. Metal Wall, Fascia and Ceiling System

- 1. Rout and Return Wet: System shall provide a wet seal (caulked) reveal joint. The sealant type shall be as specified in specification section "Joint Sealant" and with foamed type backer rod as indicated on architectural drawings.

## 2.4 METAL SUBFRAMING

- A. Miscellaneous Metal Framing, General: ASTM C 645, cold-formed metallic-coated steel sheet, ASTM A 653, G90 (Z275) hot-dip galvanized
- B. Channel-shaped Strut:
  - 1. Dimensions:
    - a. Nominal Thickness: 0.054-inch (16-gauge) nominal thickness.
    - b. Depth: 1-1/2 inches nominal.
    - c. Front Flange: 1-13/16 inches nominal, with 1-1/2 inches diameter holes punched at 8" on center.
    - d. Rear Flange: 4 inches nominal with 1/4 inch holes punched at 8" on center and aligned with holes in the front flange.
  - 2. Fasteners for Metal Sub-framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten miscellaneous metal sub-framing members through insulation and sheathing boards into structural wall framing or substrates.

## 2.5 CONCEALED ANCHORAGE CLIP

- A. General: Provide factory-formed metal wall panels designed to be field assembled by interlocking seams and incorporating concealed fasteners.
- B. Concealed clip, longitudinal lap-seam panel with labyrinth-joint and reveal on four sides.
  - 1. Material: Zinc sheet, 16-gauge and as per approval.
    - a. Fabrication: Panels shall be factory formed from specified metal.
    - b. The standard profile shall be flat pans with reveal joints on all four sides.
    - c. Panel orientation: Vertical.
      - 1) Horizontal reveal joints as indicated by Architect.
      - 2) Vertical reveal joints as indicated by Architect.
    - d. End Folds: Panel ends shall be factory notched by automatic mechanical press equipment to form end tabs of 5/8 inch nominal length. The end tabs shall be factory folded 90 degrees to produce a "box pan" effect and allow for reveal joints on all four sides of the panel.

## 2.6 MISCELLANEOUS MATERIALS

- A. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
  2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
  3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- B. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, ceilings, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- C. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- D. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
  2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
  3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

## 2.7 ACCESSORIES

- A. Extrusions, formed members, sheet, and plate shall conform with ASTM B 209 and the recommendations of the manufacturer.
- B. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.
- C. Sealants and gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.

- D. Fabricate flashing materials from 0.030" minimum thickness aluminum sheet painted to match the adjacent curtain wall / panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.
- E. Fasteners (concealed/exposed/non-corrosive): Fasteners as recommended by panel manufacturer. Do not expose fasteners except where unavoidable and then match finish of adjoining metal.

## 2.8 FABRICATION

- A. Composition: Two (2) sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials. the core material shall be free of voids and/or air spaces and not contain foamed insulation material. products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.
- B. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
  - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
  - 2. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
  - 3. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
    - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.
- E. Tolerances
  - 1. Panel Bow: Maximum 0.8% of any 1828mm (72") panel dimension.
  - 2. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.
  - 3. Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.
  - 4. Maximum deviation from panel flatness shall be 1/8" in 5'0" on panel in any direction for assembled units. (Non-accumulative - No Oil Canning)
- F. System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.

- G. Fabricate panel system so that no restraints can be placed on the panel, which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature change and at all times remain air and water tight.
- H. The finish side of the panel shall have a removable plastic masking applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.

## 2.9 FINISH

- A. Aluminum Surfaces: Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- B. High-Performance Organic Finish: 3-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 1. Color and Gloss: As selected by Architect from manufacturer's full metallic range of colors.

## 2.10 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
  - 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
  - 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
    - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Miscellaneous Supports: Install sub-framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

### 3.3 METAL PANEL INSTALLATION

- A. Install panels in accordance with manufacturer's specifications over entire wall area.
- B. Erect panels plumb, level, and true.
- C. Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -20°F to +180°F (-29°C to +82°C). Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted.
- D. Fabrication, assembly, and erection procedure shall account for the ambient temperature at the time of the respective operation.
- E. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.
- F. Conform to panel fabricator's instructions for installation of concealed fasteners.
- G. Do not install component parts that are observed to be defective, including warped, bowed, dented, abraded, and broken members.
- H. Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return component parts which require alteration to shop for refabrication, if possible, or for replacement with new parts.
- I. Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.
- J. Erection of the panels system shall be performed in accordance with the manufacturer's erection drawings.
- K. Install self-threading screws of a size and length as recommended by manufacturer. Shim clips as required to provide a level installation with non-deteriorating shims.
- L. Make repairs and perform additional work necessary to provide a watertight condition acceptable to the Architect.
- M. Panel attachments shall be designed to accommodate the thermal expansion and contraction of the exterior material through a total of 100 degrees F. temperature change.

### 3.4 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.

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- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 07 42 15

## SECTION 07 52 00 – MODIFIED BITUMEN MEMBRANE ROOFING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SECTION INCLUDES

- A. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - 1. Multi-ply modified bitumen roofing system over rigid insulation.
  - 2. System to be torch applied.

#### 1.3 REFERENCES

- A. ASTM D41 – Standard Specification for Asphalt Primer for Used in Roofing, Damp-proofing, and Waterproofing.
- B. ASTM D312 – Standard Specification for Asphalt Used in Roofing.
- C. ASTM D2178 – Standard Specification for Asphalt-Impregnated Glass Felt used in Roofing and Waterproofing.
- D. ASTM E96 – Standard Test Method for Water Vapor Transmission of Materials.
- E. ASTM E108 Standard Test Methods for Fire Test of Roof Coverings.
- F. ASCE 7 – Minimum Design Loads for Buildings and Other Structures.
- G. NRCA – Roofing and Waterproofing Manual, Current Edition.
- H. UL – Fire Hazard Classifications.
- I. UL – Roofing System & Material Guide.
- J. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Submit specifications, installation instructions, and general recommendations from manufacturers of roofing system materials, for type of roofing required.
  - 1. Include data substantiating that materials comply with requirements, including list of materials proposed for use and manufacturer's product data sheets for other products.
  - 2. Provide sample copies of specified warranties, including evidence of application for warranty from manufacturer.
  - 3. Include complete Manufacturers instructions for periodic inspection and maintenance of roofing system in closeout documentation.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:

1. Base flashings and membrane terminations.
  2. Insulation tapered locations, including slopes.
  3. Crickets, saddles, and tapered edge strips, including slopes.
  4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
  5. Provide fastening pattern layout in compliance with ASCE 7.
  6. Submit complete installation details showing roof configuration, sheet layout, seam locations, flashing, roof slopes, details at each different perimeter condition and special conditions.
- C. Samples For the following products:
1. Cap sheet, of color required, 12" x 12" square of membrane system.
  2. Flashing sheet, of color required, 12" x 12" square of membrane system.
  3. Aggregate surfacing material in gradation and color required.
  4. Walkway surfacing of color required.
- D. Warranty: Submit sample warranty
- E. Safety Provisions:
1. Submit a complete detailed schedule of special safety provisions implemented to insure the health and safety of the people.
  2. Work shall not start without the Owner's agreement of the following provisions:
    - a. A plan for a dust free operation;
    - b. A plan for the sequencing of work and the removal of debris from the site during and after construction.
    - c. A fall protection plan indicating the contractor plans for complying with OSHA's requirements.
- F. Approvals: Manufacturer shall submit documentation that product complies with and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.
- G. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- H. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.



3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturer.
- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
  1. Submit evidence of compliance with performance requirements.
- C. Product Test Reports: For components of roofing system, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- E. Sample Warranties: For manufacturer's special warranties.
- F. Certificates included with closeout documents:
  1. Submit Manufacturers certification that materials and components furnished conform to specified requirements and that materials furnished are compatible for decks indicated.
  2. At completion of work, submit Manufacturers certification that roofing system installation is in accordance with Manufacturer's warranty requirements.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer: Obtain primary roofing materials from a single manufacturer, with at least 10-years of documented experience in the roofing material business.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
  1. The job supervisor shall have minimum 5-years of documented experience in supervising projects of this size and scope.
- C. All work shall conform to NRCA Roofing and Waterproofing Manual, and to manufacturers' instructions.
- D. Inspections
  1. The roof shall be inspected by the manufacturer's representative within one year of acceptance by the Owner in accordance with section 423.12.4, FBC, Building.
  2. Provide at a minimum one in progress inspection with the Manufacturer's Representative and the Owner's Representative. The Manufacturer's Representative shall submit a written report of the inspection results within ten (10) days after the inspection to the Architect.

3. Inspections: Provide on-site weekly inspections by Owner's representative during and after installation of roofing system.
4. The Contractor shall provide the Architect of Record a "final statement of compliance" for the Owner once the Final Inspection has been completed, stating that the finished roof membrane complies with the contractual documents in accordance with section 453.12.3, FBC, Building.

#### 1.7 PRE-INSTALLATION MEETING

- A. Preinstallation Roofing Conference: Prior to installation of roofing system, conduct a pre-installation project site conference after submittal approval.
- B. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
- C. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
- D. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- E. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
- F. Review structural loading limitations of roof deck during and after roofing.
- G. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
- H. Review governing regulations and requirements for insurance and certificates if applicable.
- I. Review temporary protection requirements for roofing system during and after installation.
- J. Review roof observation and repair procedures after roofing installation.

#### 1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
- C. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- D. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

- E. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

#### 1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Do not apply roofing membrane to damp deck surface.

#### 1.10 WARRANTIES

##### A. Manufacturer's Warranty:

1. Provide written warranty signed by the manufacturer of the primary roofing materials agreeing to replace or repair defective roof membrane and flashing materials and workmanship as required maintaining the roofing system in a watertight condition at no expense to the Owner for a period of 20-years after date of Final Completion of the entire Project.
2. In addition, provide written warranty signed by the manufacturer of primary roofing materials agreeing to allow Owner to make emergency repairs to roof without voiding manufacturer's warranty.
  - a. In conjunction with issuance of the above warranty, include:
    - i) Instructions detailing preventative maintenance required to maintain the warranty.
    - ii) Provide a list of substances, which may damage the membrane.
    - iii) Specifications on repair of the membrane Owner may do without voiding warranty.
  - b. Warranty shall include coverage for damage to building resulting from failure of roof system to resist penetration of water with no dollar limit to the value of repairs or replacements covered.
  - c. The built-up roofing membranes, insulation, coping, sheet metal as well as all accessories and appurtenances shall comprise the "Roofing System" and shall be part of a single source warranty.
3. Provide at a minimum one in progress inspection with the Manufacturer's Representative and the Owner's Representative.
4. Manufacturer's Certification:
  - a. Submit written certification signed by the manufacturer stating that the roofing system manufacturer will provide warranties, inspection and Report Services specified herein.
  - b. NOTE: Submit warranty terms with the post-bid package.
5. Provide acceptance letter from the roofing manufacturer that this specification meets the requirements of the 20-year warranty and that no criteria specified herein will impact such warranty.

- B. Installer's Warranty: Provide a written two-year warranty (starting from date of the total project's substantial completion) signed by the roofing Installer and the Contractor agreeing to replace or repair defective components and workmanship of the total roofing system.
  1. Including roofing membrane, coping, sheet metal, insulation and roofing accessories as required to maintain the total roofing system in a watertight condition at no expense to the Owner.

## 1.11 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.
  - 1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
  - 2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Tested by a qualified testing agency to resist the following uplift pressures:
  - 1. Uplift Pressures: As indicated on structural plans.
- D. Energy Star Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.
- E. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.
- G. All roofing materials shall be labeled Class A per ASTM E108 and shall be certified by a nationally recognized independent testing laboratory. All roofing systems shall be installed within the limitations of the testing procedure for surfacing, deck cross slope and combustibility.
- H. Insulation and moisture protection, insulation, moisture protection, roofing, thermal requirements, fireproofing and firestopping shall be designed and constructed in compliance with the Florida Building Code and Florida Fire Prevention Code as adopted by the State Fire Marshal.
- I. Provide an installed roofing membrane and base flashing system that does not permit the passage of water, and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.
- J. Roofing materials shall resist wind uplift forces in accordance with ASCE 7-10 with design wind speed and exposure as stated on the structural plans in accordance with chapter 35, FBC, Building.
- K. Manufacturer shall provide all primary roofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.
- L. Approvals; Manufacturer shall certify that product complies with and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.
- M. Comply with Requirements of Regulatory Agencies
  - 1. Underwriter's Laboratories, Inc.: Class A fire hazard classification.

2. Roofing system shall meet current ASCE 7 wind requirements for the roofing system.
3. Roofing system shall be designed to meet requirements in accordance with Figure 1609B, Florida Building Code.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - A. Siplast
  - B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
    - A. Soperma
    - B. Johns Manville

### 2.2 ROOFING SYSTEM

- A. System Description: A three-ply system consisting of a base membrane direct-applied to the insulation, and a cap membrane sheet. Includes flashing and all accessories required for roof installation.
- B. Base Sheet: "Paradiene 20 TGF" ASTM D6163 Type 1, Grade S, SBS-Modified Asphalt impregnated and coated sheet with glass-fiber reinforcing mat.
- C. Interply: "Paradiene 20 TGF" ASTM D6163 Type 1, Grade S, SBS-Modified Asphalt impregnated and coated sheet with glass-fiber reinforcing mat.
- D. Cap Sheet: "Paradiene 30 FR TG BW" ASTM D6163 Type 1, Grade G, SBS-Modified Asphalt impregnated and coated sheet with glass-fiber-reinforced mat and surfaced with ceramic granules.
- E. Solar Reflectance Index: Not less than an initial index of not less than 90 and an aged index of not less than 79 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
- F. Emissivity: Provide minimum initial 0.91 initial emissivity and 0.89 aged emissivity as tested in accordance with ASTM E408.

### 2.3 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing manufacturer for intended use and compatible with roofing.
- B. Asphalt Primer: ASTM D 41/D 41M.

- C. Roofing Asphalt: ASTM D 312, Type III or IV as recommended by roofing manufacturer for application.
- D. Flashing Adhesive: ASTM D4586 Type II asphalt-based, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with flashings.
- E. Asphalt Roofing Adhesive: ASTM D4479, asbestos free, of consistency required by roofing system manufacturer for application.
- F. Mastic: ASTM D4586 Type II modified bitumen; nonhardening, nonmigrating, non-skinning, and nondrying.
- G. Fasteners: Factory-coated steel fasteners complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer and as required per the product approval.
- H. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board or pressured treated wood at contractor's option.
- I. Base Flashing: "Parafor 30 TG, flashing system consisting of a prefabricated, granule surfaced, reinforced, Styrene-Butadiene-Styrene (SBS) block copolymer modified asphalt flashing membrane. The reinforcement mat shall be impregnated and coated each side with SBS modified bitumen blend.
- J. Liquid Applied Flashing: "Parapro Liquid Applied Membrane System" liquid applied flexible PMMA – based monolithic membrane form by the combination of resin and fleece fabric.
- K. Roofing Granules: Ceramic-coated roofing granules shall match roofing.
- L. Miscellaneous Accessories: Provide accessories recommended by roofing system manufacturer.

#### 2.4 ROOF EXPANSION JOINT SYSTEM

- A. Manufactures: The basis of design products "Expand-O-Flash" are manufactured by Johns Manville. Equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
- B. Sheet EPDM reinforced with closed cell urethane backing.
- C. Roof expansion joint: Style CF with FS-5000-F fire barrier or as required by expansion joint manufacturer.
- D. Roof to wall joint: Style CF/EJ with FS-5000-F fire barrier or as required by expansion joint manufacturer.
- E. Exterior vertical and horizontal wall surface joints above roof deck: WS with FS-5000-W fire barrier or as required by expansion joint manufacturer.
- F. Intersections and Transitions: Provide expansion joint manufacturers standard and custom intersections, transitions and miscellaneous items to provide a complete expansion joint system. All items provided shall be a standard of the expansion joint manufacturer.

## 2.5 RIGID INSULATION

- A. Manufactures: The basis of design products "A C Foam – III" are manufactured by Atlas Roofing Insulation. Equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
- B. General: Preformed flat and tapered roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.
- C. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, glass-fiber mat facer on both major surfaces.
- D. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.
- E. Modified Asphaltic Insulation Adhesive: Insulation manufacturer's recommended modified asphaltic, asbestos-free, cold-applied adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- F. Substrate Joint Tape: 6- or 8-inch wide, coated, glass-fiber joint tape
- G. R-Value: 5.7 per inch
- H. Roof R-Value: R-value shall be a minimum R-20 and as indicated on the drawings.

## 2.6 COVER BOARD

- A. Manufactures: The basis of design products "Dens Deck Prime Roof Board" are manufactured by Georgia Pacific. Equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
- B. Fiberglass-Mat Faced Cover Board: Comply with ASTM C1177/1177M, Type X.
  - A. Thickness: 5/8 inch.
  - B. Width: 4 feet.
  - C. Length: 8 feet.
  - D. Edges: Square.
  - E. Surfacing: Fiberglass mat on face, back and long edges.

## 2.7 WALKWAYS SURFACING

- A. Walkway Surfacing: Reinforced asphaltic composition pads with slip-resisting mineral-granule surface, or polymer-modified, reconstituted rubber pads or rolls with slip-resisting textured surface, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 3/8 inch thick, minimum.
  - A. Pad or Roll Size: 30" wide and as indicated on drawings.
  - B. Color: To match that of roofing cap sheet.

## 2.8 ENVIRONMENTAL

### A. Products

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
- B. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- C. Adhesives and sealants that are not on the exterior side of weather barrier shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - a. Plastic Foam Adhesives: 50 g/L.
  - b. Gypsum Board and Panel Adhesives: 50 g/L.
  - c. Multipurpose Construction Adhesives: 70 g/L.
  - d. Fiberglass Adhesives: 80 g/L.
  - e. Contact Adhesive: 80 g/L.
  - f. Other Adhesives: 250 g/L.
  - g. Single-Ply Roof Membrane Sealants: 450 g/L.
  - h. Nonmembrane Roof Sealants: 300 g/L.
  - i. Sealant Primers for Nonporous Substrates: 250 g/L.
  - j. Sealant Primers for Porous Substrates: 775 g/L.

## PART 3 – EXECUTION

### 3.1 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- C. Install roofing and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system.

### 3.2 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
  - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
  - 2. Verify that cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in specification section Steel Decking.
  - 4. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.
  - 5. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.



### 3.3 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Do not start the installation of accessories or membrane without the presence of the Manufacturer's Technical Representative. This requirement shall not be waived.
- D. Due to the incompatibility of various materials with the roofing membrane, the Representative shall inspect the substrate and shall have a barrier applied for complete separation and protection of the roofing membrane and accessories.
- E. Install all drains, curbs, nailers, blocking, insulation, and projections through the roof before starting membrane installation. These items may be installed after the membrane installation only with Architect's written approval, proper provision for re-inspection, and continued warranty protection.
- F. All conduits to curb mounted equipment shall be installed inside the curbs.
- G. Curbs shall be a minimum 12" high above the finished roof.

### 3.4 RIGID INSULATION INSTALLATION

- A. Coordinate installation of roof system components so rigid insulation and is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system manufacturer's written instructions for installation of roof insulation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Secure first layer according to requirements in FMG's "Approval Guide" and "RoofNav" for specified Windstorm Resistance Classification.
- E. Install subsequent layers in an adhesive according to roofing system manufacturer's instruction.
- F. Install tapered insulation under area of roofing to conform to slopes indicated.
- G. Install insulation boards with long joints in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with like material.
- H. Install one or more layers of insulation under area of roofing to achieve required thickness. Where overall thickness is 2.0 inches or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- I. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- J. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- K. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes greater than 45 degrees per manufacturer's instruction.

### 3.5 COVER BOARD INSTALLATION

- A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.
- C. Install cover board with long joints of cover board in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with cover board.
- D. Cut and fit cover board within 1/4 inch of nailers, projections, and penetrations.
- E. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

### 3.6 PREPARATION OF SUBSTRATE

- A. The applicator shall carefully inspect all surfaces of insulation and cover board, and assure all surfaces are satisfactory prior to beginning installation.
- B. Beginning insulation installation constitutes acceptance of substrate without recourse.
- C. Roofing Membrane: The manufacturer's Technical Service Representative shall carefully inspect the substrate receiving the roofing and provide a written report.
- D. Install all nails, blocking, vertical surfaces, etc. prior to proceeding with membrane installation.
- E. Verify that all units are properly secured in place prior to proceeding with membrane installation.

### 3.7 INSTALLATION OF ROOFING MEMBRANE SYSTEM

- A. Install membranes over insulation and underlayment board in accordance with accepted roofing manufacturer's specification and recommendations, and as specified below.
- B. Phased construction of roofing membrane is strictly prohibited.
- C. Complete installation of modified roofing system up to line of termination of day's work.
- D. Install temporary water cut-offs of plastic cement and base sheet strips at end of each day's work.
- E. Remove upon resumption of work.
- F. Base Flashing:
  - 1. Install in accordance with requirements of roofing system manufacturer.
  - 2. Install where roofing system abuts vertical surfaces and at other locations detailed.

G. Roof Edging:

1. Prior to application of metal edging treatment, extend roofing felts up over tapered edging and secure to wood nailer with base felt extended and folded back over ply felts.
2. After metal edging is in place, flash as recommended by roofing manufacturer.

H. Flashings: Install metal flashings in such a manner as to prevent leaks.

3.8 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings.

3.9 TRAFFIC PROTECTION

- A. Install walkway surfacing from all roof access locations as recommended by manufacturer to locations including roof-mounted equipment work locations and areas of repeated rooftop traffic and as indicated on the drawings.
- B. Provide a walkway surfacing around and on all sides of rooftop equipment.
- C. Heat-weld or adhere walkway surfacing to the roof membrane surface continuously around the perimeter of the roll.

3.10 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Provide periodic inspections of roof application by qualified technical representative of roofing manufacturer.

3.11 ROOF TESTING

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and to prepare test reports.
- B. Test Cuts: Test specimens will be removed to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
  1. Approximate quantities of components within roofing membrane will be determined according to ASTM D 3617.

2. Test specimens will be examined for interply voids according to ASTM D 3617 and to comply with criteria established in Appendix 3 in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
  3. Repair areas where test cuts were made according to roofing system manufacturer's written instructions.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
1. Notify Architect and Owner 48 hours in advance of date and time of inspection.
- D. Roofing system will be considered defective if it does not pass tests and inspections.
1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

### 3.12 CLEANING

- A. Clean up debris, excess materials, and equipment and remove from site.
- B. Remove bitumen from surfaces other than those requiring bituminous roof coatings.
- C. Remove bituminous markings from finished surfaces.

### 3.13 PROTECTION

- A. Provide special protection or avoid heavy traffic on completed work when ambient temperature is above 80°F.
- B. Restore to original condition or replace work or materials damaged during handling of bitumen and roofing materials.
- C. Do not transverse any walkways where new work has been completed where traffic must continue over finished roof membrane, protect surfaces.
- D. Do not throw or drop debris from roof, use chutes, or high lift trucks.

### 3.14 SITE ENVIRONMENTAL PROCEDURES:

- A. Waste Management: As specified in Construction Waste Management and as follows:
  1. Coordinate with manufacturer for take-back program. Set aside scrap to be returned to manufacture for recycling into new product.

### 3.15 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS \_\_\_\_\_ of \_\_\_\_\_, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: <Insert name of Owner>.
  2. Address: <Insert address>.
  3. Building Name/Type: <Insert information>.
  4. Address: <Insert address>.
  5. Area of Work: <Insert information>.
  6. Acceptance Date: \_\_\_\_\_.
  7. Warranty Period: Two Years.
  8. Expiration Date: \_\_\_\_\_.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
    - a. lightning;
    - b. Insert required wind speed in first subparagraph below.
    - c. peak gust wind speed exceeding <Insert mph (m/sec)>;
    - d. fire;
    - e. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    - f. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    - g. vapor condensation on bottom of roofing; and
    - h. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
  2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
  4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
  5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_\_  
day of \_\_\_\_\_, \_\_\_\_\_.

Authorized Signature:

\_\_\_\_\_.

Name:

\_\_\_\_\_.

Title:

\_\_\_\_\_.

END OF SECTION 07 52 00

## SECTION 07 62 00 – SHEET METAL FLASHING AND TRIM

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - 1. Manufactured Products:
    - i) Manufactured flashing and counterflashing.
    - ii) Manufactured coping.
  - 2. Formed Products:
    - i) Formed low-slope roof sheet metal fabrications.
    - ii) Formed wall sheet metal fabrications.
    - iii) Formed roof drainage sheet metal fabrications.

#### 1.3 REFERENCES

- A. AISC – Stainless Steel, Uses in Architecture.
- B. ASTM A167 – Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- C. ASTM A240/A240M – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- D. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM A666- Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- F. ASTM B32 – Standard Specification for Solder Metal.
- G. ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- H. ASTM D226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- I. AWS A2.4 – Standard Symbols Welding, Brazing, Nondestructive Examination.
- J. AWS – Structural Welding Code.
- K. ASTM D4586 – Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- L. FED A-A-51145 – Flux, Soldering, Non-Electronic Paste and Liquid.
- M. NRCA (National Roofing Contractors Association) – Roofing Manual.
- N. SMACNA – Architectural Sheet Metal Manual.

- O. AAMA 607.1 – Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
- P. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings:
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
  - 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
  - 4. Include details for forming, including profiles, shapes, seams, and dimensions.
  - 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
  - 6. Include details of termination points and assemblies.
  - 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
  - 8. Include details of roof-penetration flashing.
  - 9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
  - 10. Include details of special conditions.
  - 11. Include details of connections to adjoining work.
  - 12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches (1:10).
- C. Samples: For each type of exposed finish required, prepared on Samples of size indicated below:
  - 1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
  - 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
  - 3. Accessories and Miscellaneous Materials: Full-size Sample.
- D. Delegated-Design Submittal: Submit design calculations, analysis data and shop drawings indicating compliance with dedicated design requirements signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.
- E. Environmental:
  - 1. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
    - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
    - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.



- c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
    - d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
  2. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
    - a. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
    - b. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
    - c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
    - d. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

#### 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. All welding personnel affiliated with the site construction shall be approved certified welders and shall supply certified welding certificates to the Architect prior to commencing work.
- C. Applicator/Installer shall be a company specializing in sheet metal flashing work with minimum 5 years experience.
- D. Job supervisor shall have minimum 5-years of documented trade experience in supervision on projects of this size and type.
- E. Except as otherwise indicated, the workmanship of sheet metal work, method for forming joints, anchoring, cleating and provisions for expansion shall conform to the standard details and recommendations of the Copper Development Association and the "Architectural Sheet Metal Manual" published by SMACNA; and workmanship shall be of the best quality, in accordance with best trade practice and the recommendations and specifications of the Sheet Metal and Air Conditioning Contractors National Association, Inc.

- F. All roofing metals shall be furnished and installed by the roofing contractor.

#### 1.7 MOCK-UP

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
- B. Build mockup of typical roof edge, coping, flashing, fascia, counterflashing and other applicable sheet metal items approximately 10 feet long, including supporting construction cleats, seams, attachments, underlayment, and accessories.
- C. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- D. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.8 PREINSTALLATION MEETINGS

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
- B. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- C. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
- D. Review requirements for insurance and certificates if applicable.
- E. Review sheet metal flashing observation and repair procedures after flashing installation.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

#### 1.10 FIELD CONDITIONS

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

#### 1.11 WARRANTY

- A. Provide installer's five (5) year written warranty for sheet metal indicated.
- B. Sheet metal shall resist design wind speeds required by Florida Building Code in which installer agrees to repair or replace flashing components of roofing system that fail in materials or workmanship within specified warranty period.
- C. Sheet metal failures shall include water leaks, fasteners, accessories, flashing and sheet metal, grounds/nailers, scuttles and vents, curbs, and other flashing components of roofing system.
- D. Warranty shall be a term type, with no conditions, exclusions, including exclusions of remedies by Owner, deductibles or limitations on coverage amount. Conditions, exclusions, or dollar limits.
- E. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
- F. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.

#### 1.12 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard: Comply with NRCA's "The NRCA Roofing Manual" SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. High performance edge details must be selected from manufacturers who certify performance to meet design requirements, based upon testing of such products using the test methodologies RE 1, RE-2, and/or RE-3 as referenced by the SPRI Wind Design Guide for use with Low Slope Roofing" (April 1994). Other designs may be used, provided they are tested and certified to meet wind resistance and termination tests established for the projects building height, ground roughness factor, local wind speeds, and geographic location.
  - 1. Uplift requirements shall match requirements specified for adjacent membrane roofing.
  - 2. Wind resistance calculation will be designed specifically for the current project.

- D. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
  - 1. Design Pressure: As indicated on drawings.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- F. Delegated Design Submittal: Provide delegated design services including calculations and shop drawings for copings, drip edges, flashings, etc. with wind loads indicated on the structural drawings and to comply with performance requirements, applicable code requirements and design criteria and signed and sealed by an engineer registered in the State of Florida.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer for manufactured sheet metal flashing and trim shall be one of the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Manufactured Sheet Metal Flashing and Trim:
    - a. OMG Roofing Products.
    - b. Metal-ERA, Inc.
    - c. Architectural Products Company
    - d. Fry Reglet

### 2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Fabricate size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual" which shall take precedence over sizes and metal thickness listed within the specification.
- C. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
  - 1. Thickness: 0.032 inch (20-gauge) minimum thick unless indicated otherwise and at all locations unless indicated otherwise.

- D. Stainless Steel: Type 304 stainless steel complying with ASTM A240/A240M or ASTM A666/A666M.
  - 1. Thickness: 0.015 inch (28-gauge) unless indicated otherwise and at all locations unless indicated otherwise.
  - 2. Use: Reglets and as indicated.
- E. Flashing for Pipes, Conduits, and Round Equipment Supports: Type 304 stainless steel, 0.0187 inch thick (26-gauge), 2B, complying with ASTM A240.

## 2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing. Provide primer according to written recommendations of underlayment manufacturer.
  - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
  - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.
- B. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
  - 1. "WinterGuard HT," CertainTeed Corp.
  - 2. "Grace Ultra," Grace Construction Products
  - 3. "TW Metal and Tile Underlayment," Tamko Roofing Products

## 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
    - c. Fasteners for Aluminum Sheet: Series 300 stainless steel.

- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, non-staining tape 1/2 inch wide and 1/8 inch thick.
- D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Epoxy Seam Sealer: Two-part, noncorrosive, seam-cementing compound, recommended by manufacturer for exterior nonmoving joints, including riveted joints.
- F. Solder: Shall conform to ASTM B32 66T. Composition shall contain 50 percent tin and 50 percent lead, except as specified otherwise. Solder for metal shall be of composition as recommended by the metal manufacturer.
- G. Flux: Use resin type flux for pretinned surfaces.
- H. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.
- I. Flexible Flashing Filler: Closed-cell polyethylene or other soft closed-cell material recommended by flexible flashing manufacturer as filler under flashing loops to ensure movement with minimum stress on flashing sheet.
- J. Flexible Tubing: Tube with flexible flashing shall be equal to B.F. Goodrich. The tube shall be made from closed cell synthetic rubber foam.
- K. Water barrier (vapor barrier) under cradle to expansion joint shall be equal to B.F. Goodrich's 20 mil "Lexsuco" PVC.
- L. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M, formulated for 30-mil thickness per coat.
- M. Roofing Cement: ASTM D2822, Asphaltic.
- N. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gauge required for performance.
- O. Gutter Sealant and Adhesive: One-part synthetic rubber and resin elastomeric adhesive "Gutter Seal" as manufactured by Tremco Commercial Sealants and Waterproofing.

## 2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Reglets and Counterflashings: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with interlocking counterflashing on exterior face, of same metal as reglet.
  - 1. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.

2. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
  3. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
- B. Coping: Interlocking multi-part coping system consisting of coping formed to profile and size indicated. Provided butted joints with expansion space and 8-inch minimum wide cover and concealed backup plate. Provide minimum 20-gauge, zinc-coated steel anchor plate at coping joint and anchorage cleats. Provide formed gutter chair with prefabricated inside and outside corners, miters soldered before finishing; without exposed fasteners. All fasteners shall be stainless steel.
1. Material: Aluminum, 0.050 inch (16-gauge) minimum
- C. Through-Wall Flashing: Fabricate continuous through-wall flashings in minimum 96-inch long, but not exceeding 12-foot long sections. Fabricate through-wall flashings to extend 6 inches beyond each side of wall openings and form with 2-inch high, end dams. Fabricate from the following materials:
1. Material: Stainless Steel: 0.025" (24 gauge) thick.

## 2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

### A. General:

1. Shop fabricate in minimum 96-inch long, but not exceeding 10-foot long, sections.
2. Fabricate joint plates of same thickness as sheet metal item.
3. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg unless indicated otherwise. Shop fabricate soldered interior and exterior mitered corners, splices extending 6" each way as applicable.

### B. Stucco Stop with Counter-flashing (2-piece)

1. Provide receiver with 1.5" wall flange, 0.75" sloping stucco stop, and 0.75" flange bend downward with 0.50" hem or as indicated on drawings.
2. Shop punch wall flange for fastening.
3. Provide counterflashing with 1.5" 45° top flange with 0.35" kick back at top and 4" bottom flange formed inward 3/4" towards wall with hemmed 0.25" kick at bottom or as indicated on drawings.
4. Provide 1.5" x 4" storm cleats.

### C. Surface Mounted Flashing (1-piece):

1. Provide flashing with 1.50" wall flange with 0.25" kick at top to receive sealant, 0.50" 135° sloping top flange and 4" bottom flange formed inward 0.75" towards wall with hemmed 0.50" kick at bottom or as indicated on drawings.
2. Shop punch wall flange for fastening to meet wind loads per FBC.

D. Curb to Duct Flashing and Counter Flashing:

1. Fabricate to fit duct curbs and ducts projecting from curbs.
2. Provide 4" vertical flange to cover top edge of bituminous base flashings. Form flange bottom towards curb, with 1/4" bottom edge bent 1/4" out and hemmed.
3. At top of curbs bend metal 90° and extend horizontally over to duct, then bend upward and extend vertically not less than 3" from top edge of flashing out 3/8" to receive sealant.
4. Provide for field soldered lap joints at corners and 1" lap joints at horizontal miter splices.

E. Edge Drips and Fascia:

1. Provide continuous cleat with punched holes spaced as necessary. If cleat extends 6" or more below top fastener, provide second row of punched holes spaced as necessary.
2. Provide 4" roof flange and extend bottom drip not less than 1" below bottom of roof sheathing, with bottom 3/4" kick-out to drip water away from finish wall.
3. Material: Aluminum, 0.050 inch (16-gauge)

F. Expansion Joint Cover:

1. Provide expansion joint covers at exterior expansion joints and fabricate in configurations indicated. Lap joints minimum 4" in direction of water flow.
2. Basis of Design: "Expand-O-Flash" are manufactured by Johns Manville. Equal or better performing products of other manufacturers will be considered for acceptance by the Architect
3. Sheet EPDM reinforced with closed cell urethane backing.
4. Roof expansion joint: Style CF with FS-5000-F fire barrier or as required by expansion joint manufacturer.
5. Roof to wall joint: Style CF/EJ with FS-5000-F fire barrier or as required by expansion joint manufacturer.
6. Exterior vertical and horizontal wall surface joints above roof deck: WS with FS-5000-W fire barrier or as required by expansion joint manufacturer.
7. Intersections and Transitions: Provide expansion joint manufacturers standard and custom intersections, transitions and miscellaneous items to provide a complete expansion joint system. All items provided shall be a standard of the expansion joint manufacturer.

G. Pipes, Conduits, Wires, and Round Equipment Supports Penetrating Roofing or Resting on Roofing:

1. Pre-manufactured roof penetration seals, Type 304 stainless steel, 26-gauge, complying with ASTM A240.
2. Form tubular stainless steel sleeves sized to shape of penetration, not less than 8" above finished roofing with 4" wide base flange welded to water-tight to sleeve.
3. Shop punch flanges.
4. Seal flashing and cover with protective umbrella.

H. Sanitary Vent Stack Flashings:

1. 4 lb per ft<sup>2</sup> lead flashing.
2. Form tubular lead flashing sleeve not less than 9" high with diameter 1/2" larger than vent stack.
3. Provide 4" wide flange soldered water-tight.



4. Provide vandal-proof vent covers.

## 2.7 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof, fasten gravel guard angles to base of scupper.
  1. Fabricate to sizes, profiles and details shown on the drawings.
  2. Lock seam corners, solder water-tight and hem outer exposed edges.
  3. Provide 4" wide minimum flanges formed to fit cants, decks and vertical wall surface.
  4. Shop punch flanges for fastenings at 6" on center.
  5. Scuppers shall be so designed that they prohibit capillary action of water and extend/project far enough away from the parapet wall surface that staining will not occur on the adjacent wall surface.
- B. Collector Box: Fabricate collector box with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes and built-in overflows.
  1. Fabricate to sizes, profiles and details shown on the drawings.
  2. Lock seam corners, solder water-tight and hem outer exposed edges.
  3. Provide 4" wide minimum flanges formed to fit cants, decks and vertical wall surface.
  4. Shop punch flanges for fastenings at 6" on center.
  5. Provide 4" diameter overflow holes on both sides of collector box with stainless steel screens over the holes located on the inside face of collector box.
  6. Collector box shall be so designed that they prohibit capillary action of water and extend/project far enough away from the parapet wall surface that staining will not occur on the adjacent wall surface.
- C. Collector Box Downspouts: Fabricate complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts and straps to match gutters.
  1. Fabricate to sizes and configurations as indicated on the drawings.
  2. Downspouts shall be as indicated on drawings and fabricated in one continuous piece down to kick-out diverter section at bottom of downspout where indicated.
  3. Downspouts shall be as indicated on drawings and fabricated in one continuous piece down to tie into locations for underground drainage system where indicated.
  4. Provide 8" diameter PVC cleanout fitting with cap, provide opening in cap to accept downspout and seal fully around joint where downspout fits into cap
  5. Downspout bracket/straps: Straps shall be 1" wide by 0.080 inch (12-gauge) material located not more than 60" o.c. with top and bottom brackets located not more than 12" from ends of downspouts.
  6. Material: Aluminum 0.62 inch (14-gauge) thick extruded.
- D. Gutters: Formed complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Provide wire ball strainers of compatible metal at outlets. Finish gutters, strap and brackets to match metal roof panels.

1. Gutters shall be minimum 6" wide x 6" deep and as indicated on drawings and sized to comply with SMACNA guidelines.
  2. Material: Fabricate from material thickness to comply with SMACNA standards.
  3. Gutter straps shall be 1" wide by 0.062 inch (14-gauge) material and located at 36" o.c.
  4. Gutters support brackets shall be 1" wide by 0.080 inch (12-gauge) material and located at 36" o.c.
  5. Gutter brackets and straps shall be alternately spaced so they are offset 18".
  6. Gutters shall be in minimum 10'-0" long sections formed to provide flush exterior seams between gutter sections. Joints between gutter sections shall be 1/2" wide with 6" wide cover plates and support brackets to allow for expansion and contraction. Joints shall be fully bedded in sealant on inside joints.
  7. Expansion Joints: Butt type with cover plate.
  8. Material: Aluminum, fabricate from material thickness to comply with SMACNA standards.
- E. Downspouts: Fabricate complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts and straps to match gutters.
1. Fabricate to sizes and configurations as indicated on the drawings.
  2. Downspouts shall be as indicated on drawings and fabricated in one continuous piece down to kick-out diverter section at bottom of downspout where indicated.
  3. Downspouts shall be as indicated on drawings and fabricated in one continuous piece down to tie into locations for underground drainage system where indicated.
  4. Downspout bracket/straps: Straps shall be 1" wide by 0.080 inch (12-gauge) material located not more than 60" o.c. with top and bottom brackets located not more than 12" from ends of downspouts. Bracket shall provide 1" clear distance between wall, adjacent surface and downspout per SMACNA Fig. 1-35H. If required, insert special requirements for ridge corner units, copings, fascia, and fillers.
  5. Material: Aluminum, 0.50 inch (16-gauge) 0.062 inch (14-gauge) thick extruded.
- F. PVC Downspout Connector: PVC downspout connector with square top and round discharge for connection to underground drainage system. Top and bottom openings shall conform to downspout and storm drains sizes.
1. Manufacturers: The basis of design is "DMV Downspout Adapter Offset" as manufactured by Macon Plastics Inc. Equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
- G. Roof Drain Flashing:
1. Minimum 4 lb per ft<sup>2</sup> lead sheet flashing, 36" x 36" installed in accord with NRCA specifications.
- H. Splash Pads: Provide and install precast concrete type, of sizes and profiles indicated; minimum 3000 psi at 28 days, with minimum 5% air entrainment.

## 2.8 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
  - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  - 2. Obtain field measurements for accurate fit before shop fabrication.
  - 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
  - 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Comply with details shown and with applicable requirements of SMACNA Architectural Sheet Metal Manual.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
  - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
- E. Sealant Joints: Where movable, non-expansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- I. Do not use graphite pencils to mark metal surfaces.

## 2.9 FINISH

- A. General
  - 1. Noticeable variations in the same piece are unacceptable. 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.

2. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
3. Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.

B. Aluminum

1. High-Performance Organic Finish Three-Coat Fluoropolymer: Chemical Finish Organic Coating, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight. Complying with paint manufacturer's written instructions for cleaning, preparing, pretreating and apply coating to exposed metal surfaces to comply with AAMA 2605.
  - a. Color: As selected by Architect from full range of industry colors and color densities.

C. Stainless Steel

1. Mill 2B Cold Rolled Finish

2.10 ENVIRONMENTAL

- A. Recycled Content: Minimum total recycled content equal to 25 percent with 23 percent post-consumer recycled content or minimum 20 percent pre-consumer recycled content at Contractor's option.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
  1. Verify compliance with requirements for installation tolerances of substrates.
  2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
  3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

### 3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  - 1. Install sheet metal true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  - 2. Install sheet metal to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  - 3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
  - 4. Install exposed sheet metal with limited oil canning, and free of buckling and tool marks.
  - 5. Torch cutting of sheet metal is not permitted.
  - 6. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by installing underlayment and cover with slip sheet. or other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
- C. Expansion Provisions: Provide for thermal expansion of exposed sheet metal. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
  - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
  - 1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
  - 2. Prepare joints and apply sealants to comply with requirements in specification section "Joint Sealants."
- G. Rivets: Rivet joints necessary for strength.

### 3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
- C. Copings: Anchor to resist uplift and outward forces according to recommendations in wind load design.
  - 1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate.
  - 2. Anchor interior leg of coping with washers and screw fasteners through slotted holes.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner by means of snap-in installation and sealant or lead wedges and sealant unless otherwise indicated.
- F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

### 3.5 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters:
  - 1. Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
  - 2. Fasten gutter spacers to front and back of gutter.
  - 3. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
  - 4. Anchor gutter with straps spaced as indicated and loosely lock to front gutter bead.
  - 5. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.

C. Downspouts:

1. Join sections with 1-1/2-inch telescoping joints.
2. Provide hangers with fasteners designed to hold downspouts securely 1 inch away from walls. Locate hangers at top and bottom and on center as indicated.
3. Connect downspouts to underground drainage system where indicated.
4. Stop downspout above ground and install a splash block where indicated.

D. Scuppers:

1. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane. Anchor scupper closure trim flange to exterior wall and seal with elastomeric sealant to scupper.
2. Loosely lock front edge of scupper with conductor head.
3. Seal with elastomeric sealant exterior wall scupper flanges into back of conductor head.

E. Collector Box:

1. Continuously support collector box, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
2. Anchor collector box closure trim flange to exterior wall and seal with elastomeric sealant to scupper.
3. Loosely lock front edge of scupper with collector box.
4. Seal with elastomeric sealant exterior wall scupper flanges into back of collector box.

F. Collector Box Downspouts:

1. Join sections with 1-1/2-inch telescoping joints.
2. Provide hangers with fasteners designed to hold downspouts securely to walls.
3. Locate hangers at top and bottom and on center as indicated.
4. Connect downspouts to underground drainage system where indicated.
5. Stop downspout above ground and install a splash block where indicated.

### 3.6 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

### 3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean off excess sealants.

- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturers written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
  
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00



## SECTION 07 84 13 – PENETRATION FIRESTOPPING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Penetrations in fire-resistance-rated walls.
  - b. Penetrations in horizontal assemblies.
  - c. Penetrations in smoke barriers.

#### 1.3 REFERENCES

- A. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM E119 – Standard Test Method for Fire Tests of Building Construction and Materials.
- C. ASTM E814 – Standard Test Method of Fire Tests of Through Penetration Firestop.
- D. ASTM E1966 – Standard Test Methods for Fire Tests of Joints.
- E. FM (Factory Mutual) - Fire Hazard Classifications.
- F. UL – Fire Hazard Classifications.
- G. UL 1479 – Fire Tests of Through-Penetration Firestop.
- H. UL 2079 – Tests for Fire Resistance of Building Joint Systems.
- I. WH (Warnock Hersey) - Certification Listings.
- J. UL 263 – Fire Tests of Building Construction and Materials.
- K. UL 723 – Test for Surface Burning Characteristics of Building Materials.
- L. UL 1479 – Fire Tests of Through-Penetration Firestops.
- M. NFPA – National Fire Protection.
- N. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.
  - 1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

- C. Shop Drawings:
  - 1. Submit shop drawings showing layout, profiles, and product components.
  - 2. Include Independent laboratory with system classification number on shop drawings.
- D. Provide written documentation of applicator's qualifications, including reference projects of similar scope and complexity, with current phone contacts of references for verification.
- E. Certification from sealant manufacturers that their products are suitable for the use indicated and comply with specification requirements.
- F. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- G. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type penetration firestopping.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."
- B. Use adequate numbers of skilled workers thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this section.
- C. Applicator Qualifications:
  - 1. Applicator shall have at least 3-years experience in installing materials of types specified and shall have successfully completed at least 3-projects of similar scope and complexity.
  - 2. Manufacturer approved applicator.
  - 3. Applicator shall designate a single individual as project supervisor who shall be on site at all times during installation.
- D. Single source responsibility for firestopping materials:
  - 1. Obtain Firestop materials from single manufacturer for each different product required.
  - 2. Manufacturer shall instruct applicator in procedures for each material.
- E. Regulatory Requirements:
  - 1. Firestop System installation shall meet requirements of ASTM E-814 and provide a fire rating equal to that of the construction it penetrates.
  - 2. Proposed Firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
  - 3. For those Firestop applications not having an UL or third party tested system available through any manufacturer.
    - a. Prior to installation the manufacturer may submit to the authorities having jurisdiction for their consideration an engineering judgment derived from similar independently tested system of similar design.
    - b. Manufacturer's engineering judgment drawings must follow requirements set forth by the International Firestop Council.

1.7 MOCKUP

- A. Build mockups to set quality standards for materials and execution at a location selected by the Architect.
- B. Apply 3 sq. ft. to a representative substrate surface.
- C. Apply Firestop material to a representative penetrated masonry, concrete, stud wall, and substrate.
- D. If Architect determines mockups do not comply with requirements, reconstruct mockups until mockups are approved.
- E. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRE-INSTALLATION MEETINGS

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.
- C. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.
- D. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

1.10 SYSTEM DESCRIPTION

- A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.
- B. F-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated as determined per ASTM E814, UL 1479 but not less than that equaling or exceeding the fire resistance rating of the constructions penetrated.
- C. T-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas. T-rated assemblies are required where specified by codes or where the following conditions exist:
  - 1. Where firestop systems protect penetrations located outside of wall cavities.
  - 2. Where firestop systems protect penetrations located outside fire resistive shaft enclosures.
  - 3. Where firestop systems protect penetrations located in construction containing doors required to have a temperature rise rating.
  - 4. Where firestop systems protect penetrating items larger than a 4 inch diameter nominal pipe or 16 square inch in overall cross sectional area.
- D. Fire Resistive Joint Sealants: Provide joint sealants with fire resistance ratings indicated, as determined per ASTM E119, UL 1479 and UL 2079 but not less than that equaling or exceeding the fire resistance rating of the construction in which the joint occurs.
- E. For firestopping exposed to traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions and will meet load requirements.
  - 1. For piping penetrations for plumbing and wet pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.

2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved either by installing floor plates or by other means.
  3. For penetrations involving insulated piping, provide through-penetration firestop systems not required removal of insulation.
- F. For through-penetration firestop systems exposed to view, provide products with flame spread of less than 25 and smoke developed ratings of less than 450, as determined per ASTM E 84.
- G. Firestopping Materials: ASTM E119, ASTM E814, UL 263 or UL 1479 to achieve fire rating.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer shall be one of the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
1. Specified Technologies Inc.
  2. Hilti, Inc.
  3. 3M Fire Protection Products.
  4. Tremco, Inc.; Tremco Fire Protection Systems Group.
  5. USG Corporation.

### 2.2 FIRESTOPPING, GENERAL

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.
1. All materials shall comply with ASTM E814 or E119 (UL 1429), and shall be manufactured of nontoxic, non-hazardous, asbestos free materials, and unaffected by water or moisture when cured.
  2. Primers: Conform to manufacturer's recommendations for primers required for various substrates and conditions.
  3. Backup Materials: Backup materials, supports, and anchoring devices shall be provided as required by UL testing.
- B. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance rated systems. Accessories include but are not limited to the following items:
1. Permanent forming/damming/backing materials must be noncombustible and may include the following:
    - a. Semi-refractory fiber (mineral wool) insulation.

- b. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
    - c. Joint fillers for joint sealants.
  2. Temporary forming materials.
  3. Substrate primers.
  4. Collars.
  5. Steel sleeves.
- C. Use only firestopping products that have been UL 1479 or ASTM E814 tested for specific fire rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire rating involved for each separate instance.

### 2.3 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
  1. Fire-resistance-rated walls include fire walls fire-barrier walls smoke-barrier walls and fire partitions.
  2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
  1. Horizontal assemblies include floors floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies.
  2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
  3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
  1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.
- E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.
- F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

## 2.4 ACCESSORIES

- A. Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
  - 1. Permanent forming/damming/backing materials, including the following:
    - a. Slag-wool-fiber or rock-wool-fiber insulation.
    - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    - c. Fire-rated form board.
    - d. Fillers for sealants.
  - 2. Temporary forming materials.
  - 3. Substrate primers.
  - 4. Collars.
  - 5. Steel sleeves.
- B. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces.
- C. Installation Accessories: Clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
- D. Intumescent fiberglass bags for sealing cable tray openings.
- E. Surface Sealer: Single-component, silicone sealant flexible firestop. Provide at joints over mineral wool filler and as indicated.
  - 1. Manufacturers: The basis of design product "Fire Barrier 100NS" manufactured by 3M. Equal or better performing products of other manufacturers will be considered for acceptance by the architect.

## 2.5 MIXING

- A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

## 2.6 ENVIRONMENTAL

- A. Data: Submit manufacturer's product data for sealants. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.
- B. Certification: Submit manufacturer's certification that products comply with Bay Area Resources Board, reg. 8, rule 51.
- C. 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.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
  1. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
  2. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

### 3.3 INSTALLATION

- A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- C. Install fill materials for firestopping by proven techniques to produce the following results:
  1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.



2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 IDENTIFICATION

- A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
  1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage".
  2. Contractor's name, address, and phone number.
  3. Designation of applicable testing and inspecting agency.
  4. Date of installation.
  5. Manufacturer's name.
  6. Installer's name.

### 3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Contractor will engage a qualified testing agency to perform tests and inspections of penetration firestopping systems according to ASTM E 2174, Standard Practice for On-Site Inspection of Installed Fire Stops.
- B. Where deficiencies are found or penetration firestopping systems are damaged or removed due to testing, repair or replace penetration firestopping systems so they comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

### 3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 84 13



## SECTION 07 92 00 – JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Exterior and interior sealants.
    - b. Spray foam sealant.

#### 1.3 REFERENCES

- A. ACI 504 R – Guide to Joint Sealants for Concrete Structures.
- B. ASTM C834 – Standard Specification for Latex Sealants.
- C. ASTM C919 – Standard Practice for Use of Sealants in Acoustical Applications.
- D. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.
- E. ASTM C 1193 – Standard Guide for Use of Joint Sealants.
- F. ASTM D1056 – Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
- G. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.
- H. California South Coast Air Quality Management District (SCAQMD) #1168.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer.

- C. Certificates from the manufacturers of joint sealants attesting that their products comply with the specification and are suitable for the use indicated.
- D. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.
- E. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:
  - 1. Joint-sealant location and designation.
  - 2. Manufacturer and product name.
  - 3. Type of substrate material.
  - 4. Proposed test.
  - 5. Number of samples required.
- F. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in within.
- G. Field-Adhesion-Test Reports: For each sealant application tested.
- H. Sample Warranties: For special warranties.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.
  - 1. Shall be a sealant and caulking subcontractor with a minimum of five (5) years of successful experience in the application of the types of materials required, and who agrees to employ only skilled tradesmen for the Work.
- B. Product Testing: Test joint sealants using a qualified testing agency.
  - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

#### 1.7 PRE-INSTALLATION MEETING

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

#### 1.8 MOCK-UPS

- A. 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.

## 1.9 PRECONSTRUCTION TESTING

- A. Product Testing: Test joint sealants using a qualified testing agency.
  - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- B. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
  - 1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
  - 2. Stain Testing: Use ASTM C 1248 to determine stain potential of sealant when in contact with stone or masonry substrates.
  - 3. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
  - 4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
  - 5. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
  - 6. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.
- C. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
  - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
  - 2. Conduct field tests for each kind of sealant and joint substrate.
  - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
  - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
    - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
      - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
  - 5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
  - 6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

## 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

- B. Store and handle materials in compliance with manufacturer's requirements to prevent their deterioration or damage due to moisture, temperature, contaminants, or other causes.

#### 1.11 FIELD 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.

#### 1.12 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period of Five (5) years from date of Substantial Completion.

#### 1.13 PERFORMANCE

- A. Surface Hardness: Provide types of sealant to withstand anticipated abrasive or possible indentation as recommended by manufacturer.
- B. Compatibility: Provide materials that are compatible with the joint surfaces, joint fillers, and other materials in the joint system.
- C. Provide joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates will not sag, and will resist thermally induced movement, and exposure to weather without failure.
- D. Provide acoustical joint sealants at all walls that are STC rated or where sound attenuation blankets are used.

### PART 2 - PRODUCTS

#### 2.1 JOINT SEALANTS, 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. Caulking Compounds (Acrylic Latex Sealant)

1. Latex rubber modified, acrylic emulsion polymer sealant compound; manufacturer's standard, one-part, non-sag, mildew resistant, acrylic emulsion sealant complying with ASTM C 834, formulated for accepting paint. (Product recommended for exposed interior locations involving joint movement of less than 5%).
  2. Acceptable Standard
    - a. "Sonolac"; Sonneborn Building Products, Inc.
    - b. "Acrylic Latex Caulk 832"; Tremco, Inc.
    - c. "Acrylic Latex Caulk with Silicone"; DAP
    - d. "Powerhouse Siliconized Acrylic Latex Sealant"; Sherwin-Williams
- C. One-Part Elastomeric Sealant (Silicone)
1. One component elastomeric sealant complying with ASTM C 920, Class 25, Type NS (non-sag), unless manufacturer recommends Type S (self-leveling) for the application shown. (general caulking, glazing applications).
    - a. Acceptable Standard
      - i) "Dow Corning 791; Dow Corning Corp.
      - ii) "Omniseal"; Sonneborn Building Products, Inc.
      - iii) "Spectrem 2; Tremco, Inc.
      - iv) "MAXFLEX Acrylic Urethane Elastomeric Sealant"; Sherwin-Williams
- D. One component mildew resistant silicone sealant used around countertops, backsplashes, and other wet interior locations.
1. Acceptable Standard
    - a. "Dow Corning 786"; Dow Corning Corp.
    - b. "Sanitary 1700"; General Electric
    - c. "White Lightning Silicone K&B Sealant"; Sherwin-Williams
  2. One-component high movement joints (+100/-50) use sealants in locations indicating high movement.
    - a. "Dow Corning 790"; Dow Corning Corp.
    - b. "Spectrem 1"; Tremco, Inc.
    - c. "LOXON H1 Hybryd"; Sherwin-Williams
- E. Elastomeric Sealants (Polyurethane)
1. One component polyurethane sealant, complying with ASTM C 920, Type S, Grade NS (non-sag), Class 25 (masonry expansion and control joints, perimeter caulking, flashing and sheet metal conditions).
    - a. Acceptable Standard
      - i) "Sonolastic NP 1"; Sonneborn Building Products, Inc.
      - ii) "Dymonic"; Tremco, Inc.
      - iii) "Dynatrol I"; Pecora Corp.
      - iv) "LOXON S1"; Sherwin-Williams
  2. Multi-component epoxidized polyurethane sealant complying with ASTM C 920, Type M, Grade NS, Class A (same uses as described in item 1, also used on fire resistance rated joint design details.)
    - a. Acceptable Standard
      - i) "Dymeric"; Tremco, Inc.
      - ii) "DynaTrol II"; Pecora Corp.
- F. One-part self-leveling polyurethane sealant (for traffic areas)

1. One component polyurethane self-leveling sealant, complying with ASTM C 920, Type S, Grade P, Class 25.
  - a. Acceptable Standard
    - 1) "Sonolastic SL 1"; Sonneborn Building Products, Inc.
    - 2) "NR-201 Urexpam"; Pecora Corp.
    - 3) "LOXON SL1"; Sherwin-Williams
- I. Spray Foam (Joint between top of interior smoke walls and exterior walls and metal deck above and as indicated elsewhere)
  1. Low pressure two-component polyurethane expanding spray foam.
    - a. Basis of Design: "Touch n Foam Professional – All Purpose Spray Foam".  
Manufacturers: The basis of design product is manufactured by DAP Products Inc. Equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. Rating: Class A fire resistance

## 2.2 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, provide one of the following:
    - a. Sherwin Williams "Powerhouse Siliconized Acrylic Latex Sealant".
    - b. Pecora Corporation "AC-20 FTR".
    - c. USG Corporation "SHEETROCK Acoustical Sealant".
- B. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E90.
- C. Product has flame spread and smoke developed ratings of less than 25 per ASTM E84.
- D. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, non-hardening, non-skinning, non-staining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

## 2.3 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and 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.



## 2.4 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: Nonstaining, nonabsorbent 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. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  - 3. Remove laitance and form release agents from concrete.
  - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 SELECTION OF MATERIAL

- A. Caulking compounds shall be used for interior nonmoving joints and at locations specifically indicated on drawings.
- B. One component elastomeric silicone sealants shall be used at all exterior joints and interior joints where thermal or dynamic movement is anticipated.
- C. One component elastomeric polyurethane sealants shall be used at interior joints where weatherproofing is required.
- D. One-part self-leveling polyurethane sealants shall be used for exterior and interior horizontal joints subject primarily to pedestrian traffic and light and moderated vehicular traffic, and in all control joints in slab-on-grade; interior.
- E. Acoustical joint sealants shall be used at all walls that are STC rated or where sound attenuation blankets are used.

### 3.4 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
  - 1. Joints to be filled shall be thoroughly dry and free from dust, dirt, oil, and grease at the time of application or caulks or sealants.
  - 2. Expansion and control joints in exterior walls shall have the joint filler material built into the wall, or between wall and slab, at the time of construction.
  - 3. Masking: Metal shall be masked with masking tape, as well as other surfaces where its required to prevent the sealant smearing the adjacent surface. Upon completion of the caulking, remove the tape.
  - 4. Sealants shall be integral color. Painting of sealants is not allowed.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated. Provide concave joint.
- C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
  - 1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
    - a. Do not leave gaps between ends of joint fillers.
    - b. Do not stretch, twist, puncture, or tear joint fillers.
    - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
- E. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint

configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

- F. Tooling of Non-sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
- G. Sealant Locations
1. Install in exterior joints in vertical surfaces and non-traffic horizontal surfaces as indicated below:
    - a. Joints between different materials.
    - b. Perimeter joints between materials and frames of doors, windows and louvers.
    - c. Control and expansion joints in ceiling and overhead surfaces.
    - d. Other joints as indicated or required.
  2. Install in exterior joints in horizontal traffic surfaces as indicated below:
    - a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
    - b. Joints between different materials listed above.
    - c. Other joints as indicated or required.
  3. Install in interior joints in vertical surfaces and horizontal non-traffic surfaces as indicated below:
    - a. Perimeter joints of exterior openings where indicated.
    - b. Joints between tops of non-load-bearing unit masonry walls and underside of cast-in-place concrete slabs and beams.
    - c. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
    - d. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
    - e. Perimeter joints of toilet fixtures and accessories.
    - f. Other joints as indicated or required.
  4. Install in interior joints in horizontal traffic surfaces as indicated below:
    - a. Control and expansion joints in cast-in-place concrete slabs.
    - b. Other joints as indicated or required.

### 3.5 SPRAY FOAM INSTALLATION

- A. Verify that substrates are clean, dry, and free of substances that are harmful to insulation.
- B. Comply with insulation manufacturer's written instructions applicable to products and applications.
- C. Spray insulation to envelop entire void area to produce a complete air barrier.

### 3.6 CLEANING AND PROTECTION

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

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

### 3.7 GENERAL INSTALLATION PROVISIONS

- A. Inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- E. Recheck measurements and dimensions, before starting each installation.
- F. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

END OF SECTION 07 92 00

## SECTION 07 95 00 – EXPANSION CONTROL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Interior expansion control systems.
    - b. Exterior expansion control systems.

#### 1.3 REFERENCES

- A. ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
- B. ASTM B308/B308M – Standard Specification for Aluminum-Alloy, 6061-T6 Standard Structural Profiles.
- C. ASTM B455 – Standard Specification for Copper-Zinc Lead Alloy (Leaded Brass) Extruded Shapes.
- D. ASTM E547 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
- E. ASTM E1399 – Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems.
- F. ASTM E1612 – Standard Specification for Preformed Architectural Compression Seals for Buildings and Parking Structures.
- G. ASTM E1783 – Standard Specification for Preformed Architectural Strip Seals for Buildings and Parking Structures.
- H. ASTM E1966 – Standard Test Method for Fire Resistive Joint Systems.
- I. UL 2079 – Joint Firestop Systems.
- J. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTAL

- A. Shop Drawings: For each expansion control system specified. Include plans, elevations, sections, details, splices, blackout requirement, attachments to other work, and line diagrams showing entire route of each expansion control system. Where expansion control systems change planes, provide isometric or clearly detailed drawing depicting how components interconnect.

- B. Samples: For each exposed expansion control system and for each color and texture specified, full width by 6 inches long in size.
- C. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- D. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each fire barrier provided as part of an expansion control system, for tests performed by a qualified testing agency.

#### 1.6 FIELD CONDITIONS

- A. Coordination: Coordinate installation of exterior wall and soffit expansion control systems with roof expansion control systems to ensure that wall transitions are watertight. Roof expansion joint assemblies are specified elsewhere.

#### 1.7 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Balco, Inc.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Construction Specialties, Inc.
  - 2. MM Systems Corporation

### 2.2 GENERAL

- A. General: Provide expansion control systems of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
- B. Furnish units in longest practicable lengths to minimize field splicing. Install with hairline mitered corners where expansion control systems change direction or abut other materials.
- C. Expansion joint which include factory-fabricated recessed elastomeric closure material, aluminum flanges and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint assemblies.
- D. Fire-Resistance Ratings: Provide expansion joint assemblies with fire barriers identical to those of systems tested for fire resistance according to UL 2079 or ASTM E 1966 by a qualified testing agency.
- E. Fire-Resistance: Provide expansion control system and fire-barrier assembly with a rating not less than that of adjacent construction.

### 2.3 INTERIOR EXPANSION CONTROL SYSTEMS

- A. The following are Basis of Design for 1" wide systems.
  - 1. Floor to Floor: 75 FPE-1
  - 2. Floor to Wall: 75 FVPE-1
  - 3. Wall to Wall: 75FWPE-1
  - 4. Wall Corner: 75FWVPE-1
  - 5. Wall to Gypsum Board Ceiling: 75FWVPE-1
  - 6. Wall to Suspended Acoustical Ceiling: ACL-1
  - 7. Gypsum Board Ceiling: WD-1
  - 8. Suspended Acoustical Ceiling: AC-1
- B. Fire Barrier Basis of Design: MetaBlock Fire Barrier

1. Provide in rating that conforms to wall, ceiling or floor rating requirements.

C. Final type as selected by the Architect.

## 2.4 EXTERIOR EXPANSION CONTROL SYSTEMS

1. Floor to Floor: BCSF-SL
2. Floor to Wall: BCSF-SL
3. Wall to Wall: BCSW

A. Fire Barrier Basis of Design: MetaBlock Fire Barrier.  
Provide in rating that conforms to wall or floor rating requirements.

B. Final type as selected by the Architect.

## 2.5 MATERIALS

A. Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063-T5 for extrusions; ASTM B 209 (ASTM B 209M), Alloy 6061-T6 for sheet and plate.

1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.

B. Stainless Steel: ASTM A 240/A 240M or ASTM A 666, Type 304 for plates, sheet, and strips.

1. Remove tool and die marks and stretch lines or blend into finish.

C. Elastomeric Seals: ASTM E 1783; preformed elastomeric membranes or extrusions to be installed in metal frames.

D. Compression Seals: ASTM E 1612; preformed elastomeric extrusions having an internal baffle system and designed to function under compression.

E. Cellular Foam Seals: Extruded, compressible foam designed to function under compression.

F. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to meet performance criteria for required fire-resistance rating.

G. Moisture Barrier: Flexible elastomeric material, PVC, minimum 30 mils thick.

H. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

I. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.



## 2.6 FABRICATION

- A. Aluminum joint, aluminum frame construction, retainers with resilient neoprene filler strip, flush and recess mounted.
- B. Back paint components in contact with cementitious materials.
- C. Galvanize embedded ferrous metal anchors and fastening devices.
- D. Shop assembled components and package with anchors and fittings.
- E. Provide joint components in single length wherever practical. Minimize site splicing.

## 2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Aluminum Finishes
  - 1. Mill finish.
  - 2. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- E. Seal Material: Manufacturer's standard.
  - 1. Color: As selected by Architect from manufacturer's full range.

## 2.8 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine surfaces where expansion control systems will be installed for installation tolerances and other conditions affecting performance of work.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Prepare substrates according to expansion control system manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion control systems. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion control systems.
- C. Cast-In Frames: Coordinate and furnish frames to be cast into concrete.

### 3.3 INSTALLATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing expansion control systems and materials unless more stringent requirements are indicated.
- B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion control systems.
  - 1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
  - 2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation. Notify Architect where discrepancies occur that will affect proper expansion control system installation and performance.
  - 3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
  - 4. Repair or grout blockout as required for continuous frame support using nonmetallic, shrinkage-resistant grout.
  - 5. Install frames in continuous contact with adjacent surfaces.
    - a. Shimming is not permitted.
  - 6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.
- C. Seals in Metal Frames: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
  - 1. Provide in continuous lengths for straight sections.
  - 2. Seal transitions according to manufacturer's written instructions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
  - 3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
- D. Compression Seals: Apply adhesive or lubricant adhesive as recommended by manufacturer to both frame interfaces and sides of slabs before installing compression seals.
- E. Foam Seals: Install with adhesive recommended by manufacturer.
- F. Epoxy-Bonded Seals: Pressurize seal for time period and to pressure recommended by manufacturer. Do not over pressurize.
- G. Terminate exposed ends of expansion control systems with field- or factory-fabricated termination devices.

- H. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion control system materials and associated work so complete assemblies comply with assembly performance requirements.
  - 1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

#### 3.4 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
- B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store expansion joints or seals and install temporary protection over expansion control systems. Reinstall expansion joint or seals prior to Substantial Completion of the Work.

END OF SECTION 07 95 00



## SECTION 08 11 13 – HOLLOW METAL DOORS AND FRAMES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Steel Doors.
    - b. Steel Frames.

#### 1.3 REFERENCES

- A. ANSI A117.1 – Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- B. ASCE 7 – Minimum Design Loads for Buildings and other Structures.
- C. ASTM A36/A36M – Standard Specification for Carbon Structural Steel.
- D. ASTM A53/A53M – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-coated Welded and Seamless.
- E. ASTM A123/A123M – Standard Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products.
- F. ASTM A153/A153M – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- G. ASTM A568/A568M – Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
- H. ASTM A591/A591M-98 – Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Weight [Mass] Applications.
- I. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- J. ASTM C764 - Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation.
- K. ASTM C1363 – Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
- L. ASTM E413 – Classification for Determination of Sound Transmission Class.
- M. ASTM E2074 – Standard Methods of Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
- N. DHI (Door Hardware Institute) – The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- O. NFPA 80 – Fire Doors and Windows.
- P. NFPA 252 – Fire Tests for Door Assemblies.
- Q. SDI-100 – Standard Steel Doors and Frames.
- R. UL 10B – Fire Tests for Door Assemblies.

S. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- B. Shop Drawings: Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
1. Provide schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
  2. Indicate coordination of glazing frames and stops with glass and glazing requirements.
  3. Shop drawings for exterior door assemblies shall be signed and sealed by a licensed engineer registered in the State of Florida.
  4. Calculations for wind load design for exterior door assemblies shall be stamped, sealed and signed by a Professional Engineer in the State of Florida verifying compliance with ASCE/SEI 7-02.
- C. Label Construction Certification: For door assemblies required to be fire-rated and exceeding limitations of labeled assemblies, submit manufacturer's certification that each door and frame assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.
- D. Obtain approval of shop drawings prior to proceeding with manufacturing.
- E. Submit warranty as specified herein.
- F. Approval for Exterior Doors
1. Manufacturer shall submit documentation that product complies with criteria and have been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements and submit documentation.
- G. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- H. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500-mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:

1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 QUALITY ASSURANCE

- A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications Standard Steel Doors and Frames" ANSI/SDI-100 and as herein specified.
- B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies whose fire resistance characteristics have been determined per ASTM E2074 and which are labeled and listed by UL, Factory Mutual, Warnock Hersey, or other testing and inspecting organization acceptable to authorities having jurisdiction.
- C. Hollow metal supplier shall be a qualified direct distributor of products to be furnished. In addition, the distributor shall have in their regular employment an A.H.C./C.D.C. who will be available at reasonable times to consult with the Architect regarding matters affecting the door and frame openings.
- D. Preparation/Field Verification:
  1. Verify that Shop Drawings have been successfully submitted, reviewed and returned.
  2. Verify door frames are in proper location and have been properly anchored in accordance with Specifications and SDI 105 *Recommended Erection Instruction for Steel Frames*.
  3. Verify that frames comply with indicated requirements for type, size, location and swing characteristics and that they have been installed with plumb jambs and level heads.
  4. Verify that the correct door hardware has been delivered and doors have been prepped correctly.
  5. Proceed with installation of doors only after unsatisfactory conditions have been corrected. Installation of doors and hardware indicates all conditions are satisfactory.
- E. Exterior door and window assembly installations shall be weather tight and leak proof.
- F. Contractor Qualifications: Employ only experienced Contractors (Installers) skilled in the successful installation of specified materials and assemblies on similar projects for not less than five (5) years.
- G. Manufacturer's Qualifications: Employ only manufacturers who make the specified products as a regular production item.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish.

- B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new Work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames vertically at building site under cover. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters that could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inches spaces between stacked doors to promote air circulation.

#### 1.7 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

#### 1.8 PERFORMANCE

- A. Structural Performance: Provide door and frame assemblies capable of withstanding wind pressures calculated according to the following:
  - 1. Basic Wind Speed:
    - a. Comply with the Florida Building Code with the applicable Supplement and as indicated on the structural drawings.
  - 2. Importance Factor:
    - a. Comply with the Florida Building Code with the applicable Supplement and as indicated on the structural drawings.
  - 3. Approval for Exterior Doors
    - a. Manufacturer shall certify that product complies with criteria and have been tested and conform to Miami Dade County, N.O.A. or Florida Product Approval.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Steelcraft; an Ingersoll-Rand company
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Quality Engineering
  - 2. Ceco Door Products; an Assa Abloy Group company
  - 3. Curries Company; an Assa Abloy Group company
  - 4. Firedoor Corporation



C. Florida Product Approvals

1. Hollow Metal Single Flush Door – NOA 17-0426.02
2. Hollow Metal Double Flush Door – NOA 17-0426.04
3. Hollow Metal Single Glazed Door – NOA 17-0426.01
4. Hollow Metal Double Glazed Door – NOA 17-0426.03
5. Borrowed Lights – NOA 16-1206.06
6. Transom sidelights – NOA 15-0930.06

2.2 DOOR TYPES

A. Exterior Door Material: Commercial quality carbon steel conforming to ASTM A568 and ASTM A653 for hot dipped G90 galvanized steel. All exterior doors to be galvanized or hot dipped.

B. Interior Door Material: Commercial quality carbon steel conforming to ASTM A568 and ASTM A653 for hot dipped G90 galvanized steel.

C. The following door types shall conform to the Steel Door Institute Standards as described in SDI 100.

D. Exterior Doors

1. Door face sheets shall be formed from one sheet of metal with no face seams. The top and bottom of the door shall be closed with a flush, full width steel closure treatment fabricated from the same gauge as the door.
2. Core Material
  - a. Rigid Polystyrene – R-value 2.36 per ASTM C1363.
  - b. Mineral (Equipment rooms and rooms with electrical panels.)
3. Provide 1-3/4 inch thick doors and in a size width of doors indicated, as required, where full mortise continuous gear hinges are scheduled.
4. Face sheets shall be hot-dipped galvanized steel sheets conforming to ASTM A653, Commercial Steel (CS) Class B coating, mill phosphatized.
5. Provide doors complying with requirements indicated by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level and other indicated requirements.
  - a. Rating: Extra Heavy Duty.
  - b. Classification: Level 3.
  - c. Physical Performance: Level A
  - d. Edge: Model 1 – Full Flush
  - e. Steel: 16-gauge.
  - f. Finish: G90.

E. Interior Doors

1. Door face sheets shall be formed from one sheet of metal with not face seams. Seams on vertical door edges shall be tight, smooth, and devoid of irregularities. The top and bottom of the door shall be closed with a flush, full width steel closure treatment fabricated from the same gauge as the door.
2. A kraft resin impregnated honeycomb core shall be permanently bonded to both door skins with thermal adhesive.
3. Face sheets shall be hot-dipped galvanized steel sheet conforming to ASTM A653, Commercial Steel (CS) Class B coating, mill phosphatized.

4. Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level and other indicated requirements.
  - a. Rating: Heavy Duty.
  - b. Classification: Level 2
  - c. Physical Performance: Level B
  - d. Edge: Model 1 – Full Flush.
  - e. Steel: 18-gauge.
  - f. Finish: G90
  
- F. Lock edge of doors shall be beveled 1/8 inch in 2 inches.
  
- G. Hardware Preparation:
  1. Provide minimum hardware reinforcing gauges as required in ANSI/SDI A250.6.
  2. Doors and frames shall be reinforced, drilled and tapped to receive mortised hinges, locks, latches, and flush bolts, as required in ANSI/DHI A115 and ANSI/SDI A250.6.
  3. Doors shall be reinforced for specified surface-mounted hardware. Perform drilling and tapping as required.
  4. Locate hardware in accordance with ANSI/SDI A250.8.
  5. Hardware Reinforcement: Fabricate reinforcement plates from same material as door face sheets to comply with the following minimum sizes:
    - a. Hinges: Minimum 7-gauge by 1-1/2 inches wide by 6 inches longer than hinge, secured by not less than 6 spot welds.
    - b. Pivots: Minimum 7-gauge by 1-1/2 inches wide by 6 inches longer than hinge, secured by not less than 6 spot welds.
    - c. Lock Face, Flush Bolts, Closers, and Concealed Holders: Minimum 14-gauge.
    - d. All Other Surface-Mounted Hardware: Minimum 14-gauge.
  6. Hardware preparation shall comply with Miami-Dade NOA or Florida Product Approval.

## 2.3 FRAME TYPES

- A. Frames for exterior door openings.
  1. Frames for exterior use shall be fabricated from 14-gauge minimum galvanized G90 galvanized sheet steel.
  
- B. Frames for interior door openings and borrowed lights.
  1. Frame for interior use shall be fabricated from 16-gauge G90 galvanized sheet steel.
  
- C. Welded Frames: Frames shall be welded with exposed surfaces, dressed smooth and flush. Provide a temporary spreader bar securely fastened to the bottom of each frame.
  1. Frames for exterior use shall have mitered corners with frames welded continuously on the full frame profile and ground smooth to appear seamless.
  2. Frames for interior use shall have mitered corners with frame faces welded and ground smooth to appear seamless.
  3. Welded frames shall be smooth, even, and have no blemishes or irregularities in finish or surface on all exposed sides and planes.
  4. Headers and jambs shall be secured at corners either by external welding with seamless face joints.
  5. Frames shall be provided with temporary spreader bars for shipping and handling purposes.

6. Knockdown and drywall type frames shall not be used unless dictated by specific project conditions leaving no other reasonable alternative.
  7. Mullions and transom bars shall be joined to adjacent members by welding. Face joints shall be welded and ground smooth (seamless).
  8. Frames shall be provided with a minimum of three anchors per jamb suitable for the adjoining wall construction. Frames over 7'-6" shall be provided with additional wall anchors as required.
  9. In addition, frames shall be provided with minimum 18-gauge base anchor. For existing masonry wall conditions that will not accept base anchor, an additional jamb anchor shall be provided.
  10. Frames shall be furnished in manufacturer's standard factory-applied coat of rust-inhibiting primer complying with ANSI/SDI A250.10 for acceptance criteria.
  11. Provide 7-gauge universal steel hinge reinforcement and prepare for 4-1/2" x 4-1/2" standard or heavy weight template hinges.
  12. Strike jambs 14-gauge reinforcement
- D. Frames for paired doors shall be furnished with a stationary center mullion where indicated.

## 2.4 FRAME ANCHORS

- A. Use steel anchors sized to accommodate frame jamb depth and face dimension on frames.
1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
    - a. Jamb Anchor Locations: Locate jamb anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 30 inches o.c., to match coursing, and as follows:
      - 1) Two anchors per jamb up to 60 inches high.
      - 2) Three anchors per jamb from 60 to 90 inches high.
      - 3) Four anchors per jamb from 90 to 120 inches high.
      - 4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
    - b. Post-installed Expansion Anchors for In-place Concrete or Masonry: Minimum 3/8" diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall with throat reinforcement plate welded to frame at each anchor location.
  2. Stud-Wall Type: Manufacturer's adjustable type compression anchors at drywall locations. Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
    - a. Jamb Anchor Locations: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 30 inches o.c. and as follows:
      - 1) Three anchors per jamb up to 60 inches high.
      - 2) Four anchors per jamb from 60 to 90 inches high.
      - 3) Five anchors per jamb from 90 to 96 inches high.
      - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
- B. Sleeve anchors shall be fire rated for the types of openings required.
- C. Floor Anchors: Provide floor angle clip type anchors formed from same material as frames, minimum thickness of 16-gauge for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
1. Anchors to receive 2 fasteners per jamb and welded to bottom of each jamb.

2. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated as approved by shop drawings.

- D. Masonry and Concrete Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.

## 2.5 DOOR ACCESSORIES

### A. Lites

1. Glazed Lites: Furnish 20-gauge metal glazing beads of the same type of finish for lites in interior and exterior doors, hollow metal frames and transoms, side lights, interior glazed panels, and other locations where beads are indicated in pressed steel frames.
  - a. Secure stops with countersunk flat or oval head machine screws spaced uniformly not more than 9" o.c. and not more than 2" from each corner.
  - b. Exterior glazing beads shall be installed on the exterior side of the frame with tamper-resistant screws to comply with wind loading.

- B. Plaster Guards: Provide 26-gauge steel plaster guards or mortar boxes, welded to the frame, at back of door hardware cutouts where mortar or other materials might obstruct hardware operation.

- C. Door Silencers: Drill stops and install 3 silencers on strike jambs of single swing frames and 2 silencers on heads of double swing frames.

## 2.6 FRAME ACCESSORIES

- A. Removable Mullion: Provide removable steel mullion with single operation keyed mortise cylinder at paired door locations indicated. The unit shall be self-locking when re-installed without use of cylinder key. The assembly shall be large missile impart rated with document approval.

## 2.7 FIRE DOORS AND FRAMES

- A. Provide approved and labeled hollow metal fire doors and frames at locations indicated in Door Schedule. Approved doors, frames, and hardware shall be constructed and installed in accordance with requirements of NFPA 80 and tested by UL (Underwriter's Laboratories, Inc.) or WH (Warnock Hersey) for the class of door opening indicated in schedules.
- B. Labeled metal frames are required for labeled doors.
- C. All labels shall be metal, attached to the frame where required by code. Stamped labels will not be acceptable. Labels shall not be painted.

## 2.8 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

- C. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
- D. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Supports and Anchors: Fabricate of not less than 18-gauge galvanized sheet steel.
- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
- H. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A153, Class C or D as applicable.
- I. Loose Fill Mineral Wool: Nodulated mineral fiber loose fill density, 4-6 lbs. cu. Ft., ASTM C764, Type I, Class 1 with maximum flame-spread of 25 and smoke-developed indexes of 50, respectively, per ASTM E 84.
- J. Bituminous Paint: Cold-applied non-fibered asphalt emulsion complying with ASTM D1227, Type 2 formulated for 30 mill thickness per coat minimum.
  - 1. Exterior frames shall be coated completely on the inside and at points in contact with masonry or concrete with bituminous mastic coating.
  - 2. Interior frames set in masonry or concrete walls shall be coated completely on the inside and at points in contact with masonry or concrete with bituminous mastic coating.
  - 3. Interior frames in partition walls shall be coated on the inside with bituminous mastic coating up to 1 foot above the floor.

## 2.9 FABRICATION, GENERAL

- A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Accurately form metal to required sizes and profiles. Wherever practicable, fit and assemble units in the manufacturer's plant. Clearly identify Work that cannot be permanently factory assembled before shipment, to assure proper assembly at the project site. Lock edges of doors shall be beveled 1/8 inch in 2 inches.
- B. Panels and edge channels of exterior doors shall be fabricated from galvanized sheet steel. Panels and edge channels of interior doors shall be fabricated from cold rolled sheet steel. Sizes, types, and assemblies shall be as indicated on the Drawings, Door Hardware Schedule, and as specified.
- C. Fabricate concealed stiffeners, reinforcement, edge channels, and moldings from either cold rolled or hot rolled steel (at fabricator's option).
- D. Exposed Fasteners: Provide countersunk, tamper-resistant, flat Phillips heads for exposed screws and bolts.

- E. Provide minimum 12-gauge frame head reinforcement for closers, surface, and concealed overhead stop and holders, removable mullions, flush bolts, and top latch of vertical rod exit devices.
- F. Hardware Preparation
1. Prepare hollow metal units to receive mortised and concealed door hardware, including cutouts, reinforcing, drilling, and tapping in accordance with final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation."
  2. Locate finish hardware as shown on final shop drawings, or if not shown, in accordance with recommended hardware locations specified in "S.D.I. 100-98, Recommended Specifications, Standard Steel Doors and Frames," as published by the Steel Door Institute.
  3. Reinforce all steel frames to receive surface mounted closers, whether or not scheduled to receive them.
  4. Reinforce hollow metal units to receive surface applied hardware. Drilling and tapping for surface applied door hardware may be done at project site.
  5. Hollow metal units shall be reinforced, drilled and tapped to receive mortised hinges, locks, latches, and flush bolts, as required in ANSI/DHI A115 and ANSI/SDI A250.6.
  6. Locate hardware in accordance with ANSI/SDI A250.8.
  7. Hardware Reinforcement: Fabricate reinforcement plates from same material as hollow metal units to comply with the following minimum sizes:
    - a. Hinges: Minimum 7-gauge by 1-1/2 inches wide by 6 inches longer than hinge, secured by not less than 6 spot welds.
    - b. Pivots: Minimum 7-gauge by 1-1/2 inches wide by 6 inches longer than hinge, secured by not less than 6 spot welds.
    - c. Provide minimum 12-gauge frame head reinforcement for closers, surface, and concealed overhead stop and holders, removable mullions, flush bolts, and top latch of vertical rod exit devices.
    - d. Provide minimum 14-gauge reinforcement for surface exit devices, floor check hinges and strike jambs.
    - e. Provide minimum 16-gauge reinforcement for pull bars.
  8. Hardware preparation shall comply with Miami-Dade NOA or Florida Product Approval.
- G. Shop Painting
1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."
  2. Clean, treat, and shop paint all surfaces of fabricated hollow metal doors and frames, including galvanized surfaces plus back prime of all hollow metal door frames.
  3. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before the application of the shop coat of paint.
  4. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive field applied paint.

## 2.10 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.
- B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions for Steel Frames," unless otherwise indicated.
  - 1. Set frames prior to construction of enclosing walls and ceilings. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
  - 2. Install fire-rated frames in accordance with NFPA Standard No. 80.
  - 3. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In closed steel stud partitions, attach wall anchors to studs with screws.
  - 4. Set frames in position; plumb, align, and brace securely until permanent anchors are set. Anchor bottom of frames to floors with expansion bolts or with power fasteners. Where frames require ceiling struts or other structural overhead bracing, they shall be anchored securely to ceilings or structural framing above, as indicated or specified.
  - 5. The finished work shall be rigid, neat in appearance, and free from defects. Form molded members straight and true with joints coped or mitered, well formed, and in true alignment. Welded joints on exposed surfaces shall be dressed smooth so they are invisible after finishing.
  - 6. Provide filler plate at all hardware preps, such as hinge and strike preps, that are unused.
  - 7. Exterior frames shall be filled completely with grout after installation of frame.
  - 8. Interior frames set in masonry or concrete walls shall be filled completely with grout after installation of frame.
  - 9. Coordinate installation of frames to allow for solidly filling space between frames and masonry or concrete with grout. Take precautions including bracing frames to ensure that frames are not deformed or damaged by grout forces.
  - 10. Spot grout fill interior metal frames in gypsum wallboard partitions with gypsum board compound at hinge and strike locations. Fully fill interior frames with gypsum board compound at mechanical room walls.
  - 11. Solidly pack mineral-fiber insulation inside metal stud partitions frames.
  - 12. Set exterior door lite frames in full bed of sealant and do not over tighten screws. Bent or deformed exterior lite frames will be replaced.
  - 14. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Door Installation: Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI-100.
  - 1. Install fire-rated doors with clearances as specified in NFPA Standard No. 80-07.
- D. Provide all items and accessories as required for a complete installation in every respect.

- E. Corrosion Protection: Coat surfaces that will come into contact with grout, concrete, masonry, wood, or dissimilar metals and as indicated with a heavy coat of bituminous paint.

### 3.2 GENERAL INSTALLATION PROVISIONS

- A. Inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

### 3.3 ADJUST AND CLEAN

- A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.
- C. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

### 3.4 FIELD QUALITY CONTROL

- A. Damaged work will be rejected and shall be replaced with new work at no additional cost to the Owner or Architect.
- B. After installation, protect doors and frames from damage during subsequent construction activities.

END OF SECTION 08 11 13



## SECTION 08 14 16 – FLUSH WOOD DOORS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Solid-core doors and transom panels with wood-veneer faces.
  - b. Factory finishing flush wood doors.
  - c. Factory fitting flush wood doors to frames and factory machining for hardware.

#### 1.3 REFERENCES

- A. ASTM D 1037 – Standard Test Method for evaluating properties of Wood-Based Fiber and Particle Panel Materials.
- B. ASTM E152 – Methods of Fire Tests and Door Assemblies.
- C. ASTM E413 – Classification for Determination of Sound Transmission Class.
- D. ASTM E2074 – Standard Methods of Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
- E. ASTM F476 – Standard Test Method for Security of Swinging Door Assemblies.
- F. AWI – Quality Standards of the Architectural Woodwork Institute.
- G. WDMA – Window & Door Manufacturers Association.
- H. HPMA HP – Hardwood and Decorative Plywood.
- I. ANSI A115.1 W Series, Wood Door Hardware Standards.
- J. NFPA 80 – Fire Doors and Windows.
- K. NFPA 252 – Standard Method of Fire Tests for Door Assemblies.
- L. UL 10B – Fire Tests of Door Assemblies.
- M. UL 10C – Fire Tests for Door Assemblies – Positive Pressure.
- N. Warnock Hersey – Certified Listings for Fire Doors.
- O. WDMA Industry Standards 1.S.I-A-97 – Window and Doors Manufacturer Association.
- P. Window and Door Manufacturers Association – WDMA I.S.1-A Architectural Wood Flush Doors.
- Q. Window and Door Manufacturers Association – WDMA I.S. 10 Industry Standard for Testing Cellulosic Composite Materials for Use in Fenestration Products.
- R. FBC – Florida Building Code.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction, and trim for openings. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
1. Dimensions and locations of blocking, cutouts, undercuts and mortises and holes for hardware.
  2. Dimensions for Undercuts.  
Requirements for veneer matching.
  3. Fire-protection ratings for fire-rated doors.
- C. Samples:
1. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.
    - a. Provide samples for each species of veneer and solid lumber required.
    - b. Provide set of three (3) samples showing full ranges of color and grain to be expected in the finish work.
    - c. Finish veneer-faced door samples with same materials proposed for factory-finished doors.
  2. Lite and frame sections, 6 inches long, for each material and finish specified.
- D. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- E. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.
- B. Quality Standard Compliance Certificates: AWI or WDMA Quality Certification Program certificates.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body and is a certified participant in AWI's or WDMA's Quality Certification Program.
- B. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.
- C. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."
  - 1. Provide AWI or WDMA Quality Certification Labels indicating that doors comply with requirements of grades specified or provide a letter of certification.
  - 2. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.
- D. Contractor Qualifications: Employ only experienced Contractors (Installers) skilled in the successful installation of the specified materials and assemblies on similar projects for a minimum of five (5) years.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
- C. Mark each door top and bottom rail with opening number used on Shop Drawings.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during remainder of construction period.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
  - a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
  - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
  - c. Delamination of veneer from core.
2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid-Core Interior Doors: Life of installation.

#### 1.10 PERFORMANCE

- A. Fire Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Smoke Control Door Assemblies: Comply with NFPA 105.
  1. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- C. Security Comply with ASTM F476-84 Level 40.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer shall be one of the following in each category however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  1. Flush Wood Door
    - a. Algoma Hardwoods, Inc.
    - b. Eggers Industries
    - c. Graham Wood Doors; an Assa Abloy Group Company
    - d. Marshfield Door Systems, Inc.
    - e. Mohawk Doors; a Masonite Company

#### 2.2 FLUSH WOOD DOORS

- A. Solid-Core Doors:
  1. Core: Particleboard Conforming to ANSI A208.1 (Grade LD-2), CS236, Type 1, Density C, Class 1 and AWI PC-5 or PC-7 or WDMA equivalent.
  2. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.
    - a. Screw Withdrawal, Face: 700 lbf
    - b. Screw Withdrawal, Edge: 400 lbf per WDMA T.M.-10.
  3. STC Rating: Doors shall have an STC rating of 30 minimum with perimeter seals.

- B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252.
  - 1. Temperature-Rise Limit: Where indicated, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.
  - 2. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
  - 3. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as follows:
    - a. 5-inch top-rail blocking.
    - b. 5-inch bottom-rail blocking, in doors indicated to have protection plates.
    - c. 5-inch midrail blocking, in doors indicated to have armor plates.
    - d. 5-inch midrail blocking, in doors indicated to have exit devices.
  - 4. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
  - 5. Pairs: Provide formed-steel edges and astragals with intumescent seals.
    - a. Finish steel edges and astragals with baked enamel.
- C. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- D. Astragals for Fire Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge specifically for double doors.

## 2.3 VENEER-FACED DOORS

- A. Interior Solid-Core Doors:
  - 1. Grade: Premium, with Grade AA faces.
  - 2. Species: Select cherry (Wood shall be clear, heartwood, noticeable dark wood, dark spots and streaks are not allowed).
  - 3. Cut: Plain sliced.
  - 4. Thickness: 1-3/4"
  - 5. Match between Veneer Leaves: Book match.
  - 6. Assembly of Veneer Leaves on Door Faces: Running match.
  - 7. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions, balanced match finish.
  - 8. Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 10 feet or more.
  - 9. Transom Match: Continuous match.
  - 10. Exposed Vertical and Top Edges: Same species as faces - edge Type A, minimum 1 1/8" after trimming.
  - 11. WDMA I.S.1-A Aesthetic Grade, Heavy Duty Performance Grade.
  - 12. Adhesive: Interior use, Type II.

## 2.4 LITE FRAMES

- A. Wood frames for Lite Openings in Wood Doors: Vision panel sizes shall be as indicated on drawings.

1. Wood Species: Same species as, or compatible with, door faces.
2. Profile: Flush rectangular frames.
3. At 20-minute, fire-rated, wood-core doors, provide wood frames and metal glazing clips approved for such use.

B. Wood-Veneered Frames for Lite Openings in Fire Doors: Manufacturer's standard wood veneered noncombustible frames matching veneer species of door faces and approved for use in doors of fire rating indicated. Include concealed metal glazing clips where required for opening size and fire rating indicated.

1. Coordinate frame size to conform to fire glass thickness.

C. Frames to have countersunk holes and tamper proof fasteners.

D. Color: As selected by the Architect.

## 2.5 ACCESSORIES

A. Mullion: Mullions shall be manufacturer's standard wood profile to coordinate with wood bead profile and match finish. Mullions shall be true full depth mullions not applied and at locations indicated on drawings.

## 2.6 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.

C. Openings: Factory cut and trim openings through doors.

1. Lite Openings: Trim openings with moldings of material and profile indicated.
2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Specification Section "Glazing".

## 2.7 FACTORY FINISHING

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

B. Factory door finish:

1. Grade: Premium.
2. Finish: WDMA TR-4 conversion varnish or WDMA TR-6 catalyzed polyurethane.

3. Staining: Stain shall be as selected by the Architect.
4. Effect: Filled finish.
5. Sheen: Satin – verify with Architect.

## 2.8 ENVIRONMENTAL

- A. Certification: Submit FSC certification numbers, identify each certified product on a line-item basis.
- B. Ureaformaldehyde: No ureaformaldehyde products shall be added or allowed in any products.
- C. Adhesives: For adhesives, including printed statement of VOC content.
- D. Composite Wood: For composite-wood products, documentation indicating that product contains no urea formaldehyde.
- E. Recycled Content: Recycled Content of Medium-Density Fiberboard and Particleboard: Provide products with an average recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 20 percent.
- F. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.
  1. Use adhesive that has a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- G. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  1. Wood Glues: 30 g/L.
  2. Contact Adhesive: 250 g/L.
- H. Submit manufacturer's certification that products comply with VOC limits when calculated according to 40CFR 59, Subpart D (EPA Method 24).
- I. Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
- J. Submit Green Seal Certification to GS-36 and description of the basis of certification.
- K. Submit manufacturer's certification that products comply with SCAQMD #1168. Submit manufacturer's certification that products comply with SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions do exist or direct exposure to moisture can occur, submit manufacturer's certification that products comply with Bay Area AQMD Reg. 8, Rule 51 for containers larger than 16 oz with California Air Resources Board (CARB) for containers 16 oz or less.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
  - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
  - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Hardware: For installation, see specification section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
  - 1. Install fire-rated doors according to NFPA 80.
  - 2. Install smoke- and draft-control doors according to NFPA 105.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

### 3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16



## SECTION 08 31 13 – ACCESS DOORS AND FRAMES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Access doors and frames for walls and ceilings.
    - b. Access doors at floors.

#### 1.3 REFERENCES

- A. ASTM A36/A36M – Standard Specification for Carbon Structural Steel.
- B. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. ASTM A879/879M – Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface.
- D. ASTM A240 – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- E. ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- F. ASTM B221 – Standard Specification for Aluminum-and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- G. AAMA 2604 – Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- H. UL-Fire Resistance Directory.
- I. Warnock Hersey-Certification Listings.
- J. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product include construction details, fire ratings, materials, individual components and profiles, and finishes.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Detail fabrication and installation of access doors and frames for each type of substrate.
- C. Samples: For each type of access door and frame and for each finish specified, complete assembly minimum 6 by 6 inches in size.

- D. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- E. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

## 1.5 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection and temperature-rise limit ratings indicated, according to NFPA 252 or UL 10B.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
1. Milcor, Inc.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
1. Karp Associates, Inc.
  2. Milcor LTD
  3. J. L. Industries, Inc.; Div. of Activar Construction Products Group.
  4. Nystrom, Inc.

- C. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.

## 2.2 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

### A. Interior Flush Access Doors with Exposed Flanges (Primed Steel)

1. Basis-of-Design: "Style M"
2. Assembly Description: Fabricate door to fit flush to frame. Provide manufacturer's standard-width exposed flange, proportional to door size.
3. Locations: Wall and ceiling.
4. Material: 16-gauge door and 16-gauge frame.
5. Door Size: Size appropriate for concealed items to be accessed, minimum 12" x 12".
  - a. Provide 36" x 36" at mechanical level with cam latch and lock.
6. Finish: Primed Sheet for Door and frame.
7. Hinges: Manufacturer's standard.
8. Hardware: Cam lock.

### B. Interior Fire-Rated, Flush Access Doors with Exposed Flanges:

1. Basis-of-Design: "Style NIFR" (Primed Steel)
2. Assembly Description: Fabricate door to fit flush to frame, uninsulated. Provide self-latching door with automatic closer and interior latch release. Provide manufacturer's standard-width exposed flange, proportional to door size.
3. Locations: Wall and Ceiling
4. Material: Double 20-gauge door panels and 16-gauge frame.
5. Door Size: Size appropriate for concealed items to be accessed, minimum 12" x 12".
6. Fire-Resistance Rating: Not less than that indicated for wall type.
7. Finish: Primed Sheet for Door and frame
8. Hinges: Manufacturer's standard.
9. Hardware: Cam latch and lock.

### C. Exterior Flush Access Doors (Stainless Steel):

1. Basis-of-Design: "Style MS"
2. Assembly Description: Fabricate door to be weatherproof and fit flush to frame. Provide manufacturer's standard 2-inch thick fiberglass insulation and extruded door gaskets. Provide manufacturer's standard-width frame for surface mounting, proportional to door size.
3. Locations: Wall or Soffit.
4. Material: 16-gauge door and 16-gauge frame.
5. Door Size: Size appropriate for concealed items to be accessed, minimum 12" x 12".
6. Stainless-Steel Sheet for Door & frame: Nominal 0.062 inch, 16-gauge with No. 4 finish.
7. Hinges: Manufacturer's standard.
8. Hardware: Self-latching and lock.

## 2.3 HARDWARE

1. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

1. Self-latching Type: Self-latching with screw driver slot for opening.
2. Exterior Door and Interior Door Where Indicated Cylinder Locks: Furnish two (2) keys per lock and key all locks alike.

#### 2.4 MATERIALS

- A. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304. Remove tool and die marks and stretch lines or blend into finish.
- B. Frame Anchors: Same type as door face.
- C. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

#### 2.5 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
  1. For concealed flanges with drywall bead, provide edge trim for gypsum board securely attached to perimeter of frames.
  2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.
  3. Provide mounting holes in frames for attachment of units to metal framing.
  4. Provide mounting holes in frame for attachment of masonry anchors.

#### 2.6 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Stainless Steel Finishes:
  1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
  2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

3. Finish: #4 Satin

## 2.7 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 25 percent.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

### 3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 08 31 13



## SECTION 08 33 26 – OVERHEAD COILING GRILLES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Open-curtain overhead coiling grilles.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type and size of overhead coiling grille and accessory.
  - 1. Include construction details, material descriptions, dimensions of individual components, profiles for curtain components, and finishes.
  - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
  - 1. Include plans, elevations, sections, and mounting details.
  - 2. Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
  - 3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
  - 4. For exterior components, include details of provisions for assembly expansion and contraction.
  - 5. Show locations of controls, locking devices, and other accessories.
  - 6. Include diagrams for power, signal, and control wiring.
- C. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.
  - 1. Include similar Samples of accessories involving color selection.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1.5 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Product: Subject to compliance with requirements provide the following manufacturer.
  - 1. Cookson Company.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Cornell Iron Works, Inc.
  - 2. Overhead Door Corporation.

2.2 OPEN-CURTAIN GRILLE ASSEMBLY

- A. Basis of Design: "Model 5015"
- B. Open-Curtain Grille: Overhead coiling grille with a curtain having a network of horizontal rods that interconnect with vertical links.
- C. Operation Cycles: Grille components and operators capable of operating for not less than 20,000. One operation cycle is complete when a grille is opened from the closed position to the fully open position and returned to the closed position.
  - 1. Include tamperproof cycle counter.
- D. Grille Curtain Material: Stainless steel.
  - 1. Rod Spacing: Approximately 2 inches o.c.
  - 2. Link Spacing: Approximately 6 inches apart in a straight in-line pattern.



3. Spacers: Metal tubes matching curtain material.
  - E. Bottom Bar: Continuous doubled angles, fabricated from stainless steel and finished to match grille.
  - F. Curtain Jamb Guides: Stainless steel with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.
  - G. Hood: Stainless steel.
    1. Shape: Round.
    2. Mounting: Face of wall.
  - H. Locking Devices: Equip grille with locking device assembly.
    1. Locking Device Assembly: Inside and outside with cylinders.
  - I. Electric Grille Operator:
    1. Usage Classification: Heavy duty, 25 or more cycles per hour and more than 90 cycles per day.
    2. Operator Location: Top of hood.
    3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet or lower.
    4. Motor Exposure: Interior.
    5. Emergency Manual Operation: Push-up type.
    6. Obstruction-Detection Device: Automatic photoelectric sensor electric sensor edge on bottom bar.
      - a. Sensor Edge Bulb Color: Black.
    7. Other Equipment:
  - J. Curtain Accessories: Equip grille with push/pull handles.
  - K. Grille Finish:
    1. Stainless-Steel Finish: No. 4 (polished directional satin).
    2. PVC Spacers: Color as selected by Architect from manufacturer's full range.
- 2.3 MATERIALS, GENERAL
- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- 2.4 GRILLE CURTAIN MATERIALS AND CONSTRUCTION
- A. Open-Curtain Grilles: Fabricate metal grille curtain as an open network of horizontal rods, spaced at regular intervals, that are interconnected with vertical links, which are formed and spaced as indicated and are free to rotate on the rods.

1. Stainless-Steel Grille Curtain: ASTM A 666 or ASTM A 240/A 240M, Type 300 series.

B. Grille Curtain Jamb Guides: Manufacturer's standard shape having curtain groove with return lips or bars to retain curtain. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise; with removable stops on guides to prevent overtravel of curtain.

1. Removable Posts and Jamb Guides: Manufacturer's standard.

## 2.5 HOODS AND ACCESSORIES

A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

1. Stainless Steel: 0.025-inch- thick stainless-steel sheet, Type 304, complying with ASTM A 666 or ASTM A 240/A 240M.

B. Removable Metal Soffit: Formed or extruded from same metal and with same finish as curtain if hood is mounted above ceiling, unless otherwise indicated.

C. Push/Pull Handles: Equip push-up-operated or emergency-operated grille with lifting handles on each side of grille, finished to match grille.

## 2.6 LOCKING DEVICES

A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.

1. Lock Cylinders: Cylinders specified in Section 087100 "Door Hardware" and keyed to building keying system.

2. Keys: Four (4) for each cylinder.

B. Safety Interlock Switch: Equip power-operated grilles with safety interlock switch to disengage power supply when grille is locked.

## 2.7 COUNTERBALANCING MECHANISM

A. General: Counterbalance grilles by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Spring: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.

- C. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

## 2.8 ELECTRIC GRILLE OPERATORS

- A. General: Electric grille operator assembly of size and capacity recommended and provided by grille manufacturer for grille and operation cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking grille, and accessories required for proper operation.
  - 1. Comply with NFPA 70.
  - 2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each grille.
- C. Grille Operator Locations:
  - 1. Top-of-Hood Mounted: Operator is mounted to the right or left grille head plate, with the operator on top of the grille-hood assembly and connected to the grille drive shaft with drive chain and sprockets. Headroom is required for this type of mounting.
- D. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated.
  - 1. Electrical Characteristics:
    - a. Phase: Three phase.
    - b. Volts: 480 V.
    - c. Hertz: 60.
  - 2. Motor Size: Minimum size as indicated. If not indicated, large enough to start, accelerate, and operate grille in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
  - 3. Operating Controls, Controllers, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
  - 4. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
- E. Limit Switches: Equip motorized grille with adjustable switches interlocked with motor controls and set to automatically stop grille at fully opened and fully closed positions.
- F. Controls: Flush mounted, "Open/Close" switch with "Stop" push button: NEMA 1B.
- G. Obstruction-Detection Device: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of grille opening. Activation of sensor immediately stops and reverses downward grille travel.
  - 1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in grille opening without contact between grille and obstruction.

- a. Self-Monitoring Type: Designed to interface with grille operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, grille closes only with sustained or constant pressure on close button.
2. Electric Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
  - a. Self-Monitoring Type: Four-wire configured device designed to interface with grille operator control circuit to detect damage to or disconnection of sensor edge.
- H. Emergency Manual Operation: Equip electrically powered grille with capability for emergency manual operation. Design manual mechanism so required force for grille operation does not exceed 25 lbf.
- I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

## 2.9 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.10 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
  1. Run grain of directional finishes with long dimension of each piece.
  2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
  3. Directional Satin Finish: No. 4.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install overhead coiling grilles and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports, according to manufacturer's written instructions and as specified.
- B. Install overhead coiling grilles, hoods, controls, and operators at the mounting locations indicated for each grille.
- C. Accessibility: Install overhead coiling grilles, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.
- D. Power-Operated Grilles: Install according to UL 325.

### 3.3 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly, so that grilles operate easily, free of warp, twist, or distortion.
  - 1. Adjust exterior components to be weather resistant.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.

### 3.4 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of coiling-grille Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for grille operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
  - 1. Perform maintenance, including emergency callback service, during normal working hours.
  - 2. Include 24-hour-per-day, 7-day-per-week, emergency callback service.

END OF SECTION 08 33 26



## SECTION 08 41 13 – ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Exterior storefront system.
    - b. Exterior storefront window system.
    - c. Interior storefront system.

#### 1.3 REFERENCES

- A. AA (Aluminum Association) – Designation System for Aluminum Finishes.
- B. AAMA Series number 11 – Design Wind Loads for Buildings and Boundary Layer Wind Tunnel Testing.
- C. AAMA 101 – Standard Specification for Window, Doors, and Skylights.
- D. AAMA 200 – Standard Practice for the Installation of Windows with Frontal Flanges for Surface Barrier Masonry Construction.
- E. AAMA 502-08 – Voluntary Specification for field Testing of Newly Installed Fenestration Products.
- F. AAMA 511 – Voluntary Guideline for Forensic Water Penetration Testing of Fenestration Products.
- G. AAMA 701/702 – Combined Voluntary Specifications for Pile Weather-stripping and Replaceable Fenestration Weatherseals.
- H. AAMA 1503.1 – Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- I. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedure for Superior Performing Organic Coating on Aluminum Extrusions and Panels.
- J. ASCE 7 – Minimum Design Loads for Buildings and other Structures.
- K. ASTM A123/A123M – Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
- L. ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- M. ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- N. ASTM C509 – Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
- O. ASTM D2000 – Standard Classification System for Rubber Products in Automotive Applications.

- P. ASTM D2287 – Standard Specification for Non-Rigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds.
- Q. ASTM E283 – Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
- R. ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- S. ASTM E331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- T. ASTM E1105 – Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform or Cyclic Static Air Pressure Difference.
- U. ASTM F588 – Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.
- V. FBC – Florida Building Code.

#### 1.4 DEFINITIONS

- A. ADA/ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disability Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities."

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.
  - 2. For entrance doors, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.
- C. Samples: For units with factory-applied finishes.
- D. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12-inch lengths of full-size components and showing details of the following:
  - 1. Joinery, including concealed welds.
  - 2. Anchorage.
  - 3. Expansion provisions.
  - 4. Glazing.
  - 5. Flashing and drainage.
- E. Delegated-Design Submittal: Submit design calculations, analysis data and shop drawings indicating compliance with dedicated design requirements signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.



- F. Approval: Manufacturer submit documentation that product complies with criteria and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.
- G. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- H. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer and testing agency.
- B. Energy Performance Certificates: For glazed storefront systems, accessories, and components, from manufacturer.
  - 1. Basis for Certification: NFRC-certified energy performance values for each glazed storefront system.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems, indicating compliance with performance requirements.
- D. Warranties: Sample of special warranties.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For glazed storefront systems to include in maintenance manuals.

## 1.8 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- C. Manufacturer Qualifications: A manufacturer capable of fabricating glazed aluminum storefront and entrance systems that meet or exceed energy performance requirements indicated and of documenting this performance by certification, labeling, and inclusion in lists.
- D. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- E. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
- F. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
  - 1. Do not revise intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.
- G. Energy Performance Standards: Comply with NFRC for minimum standards of energy performance, materials, components, accessories, and fabrication. Comply with more stringent requirements if indicated.
  - 1. Provide NFRC-certified glazed aluminum storefront systems with an attached label.
- H. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.
- I. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.

## 1.9 MOCK-UPS

- A. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
- B. Build mockup of typical wall area as indicated by the Architect.
- C. Field testing shall be performed on mockup according to requirements in "Field Quality Control" Article.

- D. Approval of mockup does not constitute approval of deviations from the Contract Documents contained in mockup unless Architect specifically approves such deviations in writing.
- E. Approved mockup may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.10 PRE-INSTALLATION MEETING

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
- B. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- C. Review and discuss the finishing that is required to be coordinated with the finishing of other aluminum work for color and finish matching.
- D. Review, discuss, and coordinate the interrelationship with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
- E. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
- F. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

#### 1.11 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

#### 1.12 WARRANTY

- A. Warranty: Standard form in which manufacturer and installer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including, but not limited to, excessive deflection.
    - b. Noise or vibration caused by thermal movements.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
    - d. Adhesive or cohesive sealant failures.
    - e. Water leakage through fixed glazing and framing areas.
    - f. Failure of operating components.
  - 2. Warranty Period for installer: Two (2) years from date of Substantial Completion.
  - 3. Warranty Period for manufacturer: Five (5) years from date of Substantial Completion.
  - 4. Warranty Period for finish: Ten (10) years from date of Substantial Completion.

- B. Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or workmanship within specified warranty period. Warranty does not include normal weathering.
  - 1. Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Warranty Period: Five (5) years from date of Substantial Completion.

#### 1.13 MAINTENANCE SERVICE

- A. Entrance Door Hardware:
  - 1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

#### 1.14 PERFORMANCE REQUIREMENTS

- A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction.
  - 1. Movements of supporting structure indicated on drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
  - 2. Dimensional tolerances of building frame and other adjacent construction.
  - 3. Failure includes the following:
    - a. Deflection exceeding specified limits.
    - b. Thermal stresses transferring to building structure.
    - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
    - d. Glazing-to-glazing contact.
    - e. Noise or vibration created by wind and by thermal and structural movements.
    - f. Loosening or weakening of fasteners, attachments, and other components.
    - g. Sealant failure.
    - h. Failure of operating units.
- B. Structural Loads:
  - 1. Wind Loads: Basic wind speed, importance factor and exposure category shall be as indicated on drawings.
- C. Deflection of Framing Members:
  - 1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches and shall also comply with requirements.
  - 2. Deflection Parallel to Glazing Plane: Limited to L/360 of clear span or 1/8 inch, whichever is smaller and shall comply with requirements.

- D. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E 330 as follows:
1. Wind Loads: Basic wind speed, importance factor and exposure category shall be as indicated on drawings.
  2. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches or 3/4".
- E. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas to comply with manufacturers testing of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
- F. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
- G. Water Penetration under Dynamic Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
- H. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
  2. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
    - a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F (82 deg C).
    - b. Low Exterior Ambient-Air Temperature: 0 deg F (minus 18 deg C).
    - c. Interior Ambient-Air Temperature
- I. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 45.
- J. Thermal Conductance: Provide aluminum-framed systems with fixed glazing and framing areas having an average U-factor of not more than 0.57 Btu/sq. ft. x h x deg F.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
  2. Test Interior Ambient-Air Temperature: 75 deg F (24 deg C).
  3. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
- K. Sound Transmission: Provide aluminum-framed systems with fixed glazing and framing areas having the following sound-transmission characteristics:

1. Sound Transmission Class (STC): Minimum 32 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413 and ASTM E 1332.
- L. Delegated Design: Design aluminum-framed systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated if design exceeds limitations and provide additional elements as required to meet design loads.
- M. Approvals: Manufacturer shall certify that product complies with criteria and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  1. YKK AP American, Inc.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  1. Kawneer
  2. EFCO

### 2.2 FRAMING SYSTEMS

- A. Basis of Design:
  1. Exterior: "YES – 45TU" Insulated, Thermal Broken.
    - a. Florida Product Approval – FL #12926.3
  2. Interior: "YES – 45FS"
- B. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
  1. Glazing System: Retained mechanically with gaskets on four sides.
  2. Glazing Plane: Center.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
  1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.

2. Reinforce members as required to receive fastener threads.

- E. Anchors: Three-way adjustable anchors with minimum adjustment of that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
- F. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- G. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.

### 2.3 ENTRANCE DOOR SYSTEMS

A. Basis of Design:

- 1. Exterior – “35 D”, Insulate Glazing.
  - a. Florida Product Approval – FL #12892.1
- 2. Interior – “35 D”

B. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.

- 1. Door Construction: Fabricate from extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
- 2. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.
  - a. Provide nonremovable glazing stops on outside of door and frame.

### 2.4 ENTRANCE DOOR HARDWARE

A. General: Provide entrance door hardware for each entrance door to comply with requirements per the Florida Product Approval, the Florida Building Code and requirements indicated below, however the requirements of the Florida Product Approval and Florida Building Code shall take precedence.

- 1. Entrance Door Hardware Sets per Door Hardware specification section.
- 2. Opening-Force Requirements:
  - a. Egress Doors: Not more than 8.5 lbf to open the door to its minimum required width.
  - b. Accessible Interior Doors: Not more than 5 lbf to fully open door.

B. Opening-Force Requirements:

- 1. Latches and Exit Devices: Not more than 5 lbf required to release latch.

C. Weather Stripping: Manufacturer's standard replaceable components.

- 1. Compression Type: Made of ASTM D 2000, molded neoprene, or ASTM D 2287, molded PVC.
- 2. Sliding Type: AAMA 701, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

- D. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.
- E. Silencers: BHMA A156.16, Grade 1.
- F. Thresholds: BHMA A156.21, raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.

## 2.5 GLAZING SYSTEMS

- A. Glazing: As specified in specification section "Glazing".
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- E. Glazing Sealants: As recommended by manufacturer for joint type.
  - 1. Color: As selected by Architect from manufacturer's full range of colors.

## 2.6 ACCESSORY MATERIALS

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in specification section "Joint Sealants."
- B. Bituminous Paint: Cold-applied, non-fibered asphalt emulsion complying with ASTM D1227, Type 2 requirements formulated for 30-mil (0.762-mm) thickness per coat.

## 2.7 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  - 1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
  - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
  - 3. Extruded Structural Pipe and Tubes: ASTM B 429.
  - 4. Structural Profiles: ASTM B 308/B 308M.
- B. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
  - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
  - 2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
  - 3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.



2.8 SILL PAN AT EXTERIOR STOREFRONT

- A. Provide .125 inch aluminum sill pan with 1/4" upturn at inside edge.
- B. Finish shall match storefront system.

2.9 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
  - 1. Profiles that are sharp, straight, and free of defects or deformations.
  - 2. Accurately fitted joints with ends coped or mitered.
  - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
  - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  - 5. Provisions for field replacement of glazing from exterior.
  - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- C. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
  - 1. At exterior doors, provide compression weather stripping at fixed stops.
- D. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
  - 1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
  - 2. At exterior doors, provide weather sweeps applied to door bottoms.
- E. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- F. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.10 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- B. Aluminum Surfaces: Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.

- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- E. Interior System High-Performance Organic Finish Two-Coat Fluoropolymer: Chemical Finish Organic Coating, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight. Complying with paint manufacturer's written instructions for cleaning, preparing, pretreating and apply coating to exposed metal surfaces to comply with AAMA 2604.
  - 1. Color and Gloss: As selected by Architect from full range of industry colors and color densities.
- F. Exterior System High-Performance Organic Finish Three-Coat Fluoropolymer: Chemical Finish Organic Coating, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight. Complying with paint manufacturer's written instructions for cleaning, preparing, pretreating and apply coating to exposed metal surfaces to comply with AAMA 2605.
  - 1. Color and Gloss: As selected by Architect from full range of industry colors and color densities.

## 2.11 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.
- B. Adhesives: For adhesives and sealants used inside of the weatherproofing system, including printed statement of VOC content.
- C. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.
- D. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

#### A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
6. Seal joints watertight unless otherwise indicated.

B. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.

C. Corrosion Protection: Coat concealed surfaces that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

D. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

E. Set continuous sill members and flashing in full sealant bed per specification section "Joint Sealants" to produce weathertight installation.

F. Sill Pan Installation: Install sill pan in full bed of sealant on concrete slab prior to installing system.

G. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

H. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

I. Install perimeter joint sealants as specified in specification section "Joint Sealants" to produce weathertight installation.

J. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping. Indicate entrance door hardware mounting heights on drawings or insert in subparagraph below.

1. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

K. Install glazing as specified in specification section "Glazing."

### 3.3 ERECTION TOLERANCES

A. Install aluminum-framed systems to comply with the following maximum erection tolerances:

1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 10 feet; 1/4 inch over total length.
  2. Alignment:
    - a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch.
    - b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.
- B. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch.

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections.
- B. Testing Services: Testing and inspecting of representative areas of glazed aluminum framed assemblies shall take place as installation proceeds to determine compliance of installed assemblies with specified requirements.
- C. Test Area for Each Individual Building:
1. One bay area, but not less than 30 feet, by one story of glazed aluminum framed assemblies.
  2. Perform a minimum of two tests in areas as directed by Architect.
- D. Test Types:
1. Air Infiltration: Areas shall be tested for air leakage as indicated on manufacturers test of fixed wall area when tested according to ASTM E 783 at a minimum static-air-pressure differential of 6.24 lbf/sq. ft.
  2. Water Penetration: Areas shall be tested according to ASTM E 1105 at a minimum uniform and cyclic static-air-pressure differential of not less than 6.24 lbf/sq. ft., and shall not evidence water penetration.
  3. Water Spray Test (To be used if area is too big to accommodate a pressure chamber): Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
- E. Repair or remove work if test results and inspections indicate that it does not comply with specified requirements.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- G. Aluminum framed assemblies will be considered defective if they do not pass tests and inspections.
- H. Prepare test and inspection reports.

### 3.5 ADJUSTING

- A. Adjust operating entrance door hardware to function smoothly as recommended by manufacturer.

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1. For entrance doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches from the latch, measured to the leading door edge.

END OF SECTION 08 41 13



## SECTION 08 71 00 – DOOR HARDWARE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

- B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.

- C. Related Sections:

1. Division 08 Section "Operations and Maintenance".
2. Division 08 Section "Door Hardware Schedule".
3. Division 08 Section "Hollow Metal Doors and Frames".
4. Division 08 Section "Interior Aluminum Doors and Frames".
5. Division 08 Section "Flush Wood Doors".
6. Division 08 Section "Aluminum-Framed Entrances and Storefronts".
7. Division 08 Section "Automatic Door Operators".
8. Division 28 Section "Access Control".

- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ANSI/SDI A250.13 - Testing and Rating of Severe Windstorm Resistant Components for Swing Door Assemblies.
3. ICC/IBC - International Building Code.
4. NFPA 70 - National Electrical Code.
5. NFPA 80 - Fire Doors and Windows.
6. NFPA 101 - Life Safety Code.
7. NFPA 105 - Installation of Smoke Door Assemblies.
8. UL/ULC and CSA C22.2 – Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
9. State Building Codes, Local Amendments.

- E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

### 1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
  3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for door hardware.
    - g. Door and frame sizes and materials.
    - h. Warranty information for each product.
  4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Shop Drawings: Details of electrified access control hardware indicating the following:
  1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
    - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.



- b. Complete (risers, point-to-point) access control system block wiring diagrams.
    - c. Wiring instructions for each electronic component scheduled herein.
  2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- E. Informational Submittals:
  1. Hurricane Resistant Openings (State of Florida): Within the State of Florida, provide copy of current State of Florida Product Approval or Metro-Dade County Notice of Acceptance (NOA) as proof of compliance that doors, frames and hardware for exterior opening assemblies have been tested and approved for use at the wind load and design pressure level requirements specified for the Project.
    - a. Hurricane Resistant Components (State of Florida): Within the State of Florida, provide copy of independent, third party certified listing to ANSI A250.13.
  2. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

- D. Integrated Wiegand, Wireless, and IP-Enabled Access Control Products Supplier Qualifications: Integrated access control products and accessories are required to be supplied and installed through current members of the ASSA ABLOY "Authorized Channel Partner" (ACP) and "Certified Integrator" (CI) programs. Suppliers are to be factory trained, certified prior to project bid, and a direct purchaser of the specified product. Installers are to be factory trained, certified prior to project bid, and are responsible for commissioning, servicing, and warranting the installed equipment specified for the project.
- E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
  2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- F. Hurricane Resistant Exterior Openings (State of Florida including the High Velocity Hurricane Zone (HVHZ)): Provide exterior door hardware as complete and tested assemblies, or component assemblies, including approved doors and frames specified under Section 081113 "Hollow Metal Doors and Frames", to meet the wind loads, design pressures, debris impact resistance, and glass and glazing requirements as detailed in the current State of Florida building code sections applicable to the Project.
1. Each unit to bear third party permanent label in accordance with the Florida Building Code requirements.
- G. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- H. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
1. Function of building, purpose of each area and degree of security required.
  2. Plans for existing and future key system expansion.
  3. Requirements for key control storage and software.
  4. Installation of permanent keys, cylinder cores and software.
  5. Address and requirements for delivery of keys.
- I. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
  2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
  3. Review sequence of operation narratives for each unique access controlled opening.

4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

J. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

#### 1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

#### 1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
  1. Structural failures including excessive deflection, cracking, or breakage.
  2. Faulty operation of the hardware.
  3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
1. Ten years for mortise locks and latches.
  2. Seven years for heavy duty cylindrical (bored) locks and latches.
  3. Five years for exit hardware.
  4. Twenty five years for manual surface door closer bodies.
  5. Five years for motorized electric latch retraction exit devices.
  6. Two years for electromechanical door hardware.

## 1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

### 2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity:
    - a. Two Hinges: For doors with heights up to 60 inches.

- b. Three Hinges: For doors with heights 61 to 90 inches.
    - c. Four Hinges: For doors with heights 91 to 120 inches.
    - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
  2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
    - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
    - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
  3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
    - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
    - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
  4. Hinge Options: Comply with the following:
    - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
  5. Manufacturers:
    - a. Hager Companies (HA) - CB Series.
    - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.
    - c. Stanley Hardware (ST) - CB Series.
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.
  1. Manufacturers:
    - a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
    - b. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

## 2.3 POWER TRANSFER DEVICES

- A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
  1. Manufacturers:

- a. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE) – EL-CEPT Series.
  - b. Securitron (SU) - EL-CEPT Series.
- B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.
1. Provide one each of the following tools as part of the base bid contract:
    - a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Electrical Connecting Kit: QC-R001.
    - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.
  2. Manufacturers:
    - a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) – PoE Series.

## 2.4 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.
1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
  2. Furnish dust proof strikes for bottom bolts.
  3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
  4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
  5. Manufacturers:
    - a. Door Controls International (DC).
    - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    - c. Trimco (TC).

## 2.5 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:

1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
  2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
  3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
  4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
  5. Keyway: Match Facility Restricted Keyway.
- D. Patented Cylinders: ANSI/BHMA A156.5, Grade 1, certified cylinders employing a utility patented and restricted keyway requiring the use of patented controlled keys. Provide bump resistant, fixed core cylinders as standard with solid recessed cylinder collars. Cylinders are to be factory keyed where permanent keying records will be established and maintained.
1. Provide a 6 pin multi-level master key system comprised of patented controlled keys and security and high security cylinders operated by one (1) key of the highest level. Geographical exclusivity to be provided for all security and high security cylinders and UL437 certification where specified.
    - a. Level 1 Cylinders: Provide utility patented controlled keyway cylinders that are furnished with patented keys available only from authorized distribution.
    - b. Level 2 Cylinders: Provide utility patented controlled keyway and side bar locking incorporating unique angled bottom pins for geographical exclusivity. Cylinders constructed to provide protection against bumping and picking.
    - c. Level 3 Cylinders: Provide utility patented controlled keyway and side bar locking incorporating unique angled bottom pins for geographical exclusivity. Cylinders to be UL437 certified and constructed to provide protection against bumping, picking, and drilling.
    - d. Refer to hardware sets for specified levels.
  2. Manufacturers:
    - a. Sargent Manufacturing (SA) - Degree Series.
    - b. No Substitution.
- E. Keying System: Each type of lock and cylinders to be factory keyed.
1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
  2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
  3. Existing System: Key locks to Owner's existing system.
- F. Key Quantity: Provide the following minimum number of keys:
1. Master Keys (per Master Key Level/Group): Five (5).
  2. Construction Keys (where required): Ten (10).
  3. Permanent Control Keys (where required): Two (2).
- G. Construction Keying: Provide temporary keyed construction cores.
- H. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
  2. Provide transcript list in writing or electronic file as directed by the Owner.

- I. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

- a. Lund Equipment (LU).
- b. MMF Industries (MM).
- c. Telkee (TK).

## 2.6 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.

1. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
2. Locks are to be non-handed and fully field reversible.
3. Manufacturers:

- a. Sargent Manufacturing (SA) – 10 Line.
- b. No Substitution.

## 2.7 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

- B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.



## 2.8 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
  2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
  3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
  4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
  5. Flush End Caps: Provide flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
  6. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.
  7. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.
  8. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
    - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
  9. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
  10. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
  11. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
  12. Rail Sizing: Provide exit device rails factory sized for proper door width application.

13. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:

- a. Sargent Manufacturing (SA) - 80 Series.
- b. No Substitution.

## 2.9 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

1. Manufacturers:

- a. Corbin Russwin Hardware (RU) - DC6000 Series.
- b. Norton Door Controls (NO) - 8500 Series.
- c. Sargent Manufacturing (SA) - 1431 Series.
- d. Yale Locks and Hardware (YA) - 3500 Series.

## 2.10 ELECTROMECHANICAL DOOR OPERATORS

- A. General: Provide low energy operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.
  - 1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.
- B. Standard: Certified ANSI/BHMA A156.19.
- C. Performance Requirements:
  - 1. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
  - 2. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.
- D. Configuration: Surface mounted or in-ground as required. Door operators to control single swinging and pair of swinging doors.
- E. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19.
- F. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.
- G. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.
- H. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.
- I. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Besam Automated Entrance Systems (BE) – SW200i Series.

## 2.11 ARCHITECTURAL TRIM

- A. Door Protective Trim
  - 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
  - 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and

not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
  - a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
  - a. Hager Companies (HA).
  - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
  - c. Trimco (TC).

## 2.12 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
  1. Manufacturers:
    - a. Hager Companies (HA).
    - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    - c. Trimco (TC).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
  1. Manufacturers:
    - a. Rixson Door Controls (RF).
    - b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    - c. Sargent Manufacturing (SA).

## 2.13 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
  - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
  - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
  - 1. National Guard Products (NG).
  - 2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
  - 3. Reese Enterprises, Inc. (RE).

## 2.14 ELECTRONIC ACCESSORIES

- A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.
  - 1. Manufacturers:
    - a. Sargent Manufacturing (SA) – 3280 Series.
- B. Switching Power Supplies: Provide switching power supplies that are dual voltage, UL listed, supervised units. Units shall be field selectable with a dedicated battery charging circuit that provide 4 Amp at 12VDC or 24VDC continuous, with up to 16 independently controlled power limited outputs. Units shall tolerate brownout or overvoltage input  $\pm 15\%$  of nominal voltage and have thermal shutdown protection with auto restart. Circuit breaker shall protect against overcurrent and reverse battery faults and units shall be available with a single relay fire trigger or individually triggered relayed outputs. Provide the least number of units, at the appropriate

amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

1. Manufacturers:

- a. Securitron (SU) - AQ Series.

2.15 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.16 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

### 3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
  - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
  - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
  - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

### 3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating 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.

### 3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

### 3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

### 3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.
- C. Manufacturer's Abbreviations:

- 1. MK - McKinney
- 2. PE - Pemko
- 3. RO - Rockwood
- 4. SA - SARGENT
- 5. RF - Rixson
- 6. BM - Besam
- 7. SU - Securitron



**Hardware Sets**

**Set: 1.0**

Doors: M100.1, W100.1

Description: Exterior Aluminum-Pair - (Automatic Operators & Access Control)

2	Continuous Hinge	CFMxxHD1 PT		PE	087100
1	Exit Device (nightlatch)	55 56 AD8410 106 x 862	US32D	SA	087100
1	Concealed Vert Rod Exit	55 56 AD8410 862	US32D	SA	087100
1	Degree Cylinder	as required		SA	087100
1	Pair Door Operators	SW200i (surface pair)	689	BM	087113
1	Threshold	2005AV x door width		PE	087100
2	Electric Power Transfer	CEPT		SU	087100
2	(DPS) Switch	3287		SA	087100
2	ElectroLynx Harness	QC-C x L.A.R.		MK	087100
2	ElectroLynx Harness	QC-C1500		MK	087100
2	Door Switch	Besam		BM	
1	Multi-Class Reader	RP40		00	
1	Power Supply	AQD Series		SU	087100
1	Wiring Diagram			00	

Notes: Weather seals to be provided by door manufacturer.

-Provide necessary drop plates and fillers for proper installation of door closers

-Exterior doors and hardware to comply with FBC windstorm requirements.

**Set: 2.0**

Doors: W100A.1

Description: Exterior Aluminum-Single - (Automatic Operators & Access Control)

1	Continuous Hinge	CFMxxHD1 PT		PE	087100
1	Exit Device (nightlatch)	55 56 AD8410 106 x 862	US32D	SA	087100
1	Degree Cylinder	as required		SA	087100
1	Single Door Operator	SW200i (surface single)	689	BM	087113
1	Threshold	2005AV x door width		PE	087100
1	Electric Power Transfer	CEPT		SU	087100
1	(DPS) Switch	3287		SA	087100
1	ElectroLynx Harness	QC-C x L.A.R.		MK	087100
1	ElectroLynx Harness	QC-C1500		MK	087100
1	Door Switch	Besam		BM	
1	Multi-Class Reader	RP40		00	
1	Power Supply	AQD Series		SU	087100
1	Wiring Diagram			00	

Notes: Weather seals to be provided by door manufacturer.

-Provide necessary drop plates and fillers for proper installation of door closers

-Exterior doors and hardware to comply with FBC windstorm requirements.

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**Set: 3.0**

Doors: W100B.1

Description: Exterior Single - (Card Access - PoE)

1 Continuous Hinge	CFMxxHD1 PT		PE	087100
1 Access Control Lock (PoE)	S1-82276 IAMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Door Closer	1431 CPS	EN	SA	087100
1 Threshold	2005AV x door width		PE	087100
1 Rain Guard	346C x door width plus 4"		PE	087100
1 Gasketing	303CS head & jambs		PE	087100
1 Sweep	315CN x door width		PE	087100
1 ElectroLynx Harness	PoE-CEPT30RJ		MK	281300
1 Electric Power Transfer	CEPT-NW		SU	281300

Notes: Exterior doors and hardware to comply with FBC windstorm requirements.

**Set: 4.0**

Doors: M101.1, M111.2, M115.2, W101.2

Description: Exterior Classroom (Exit Only)

1 Continuous Hinge	CFMxxHD1		PE	087100
1 Exit Device (exit only)	HC 43 8810	US32D	SA	087100
1 Door Closer	1431 CPS	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Threshold	2005AV x door width		PE	087100
1 Rain Guard	346C x door width plus 4"		PE	087100
1 Gasketing	303CS head & jambs		PE	087100
1 Sweep	315CN x door width		PE	087100
1 (DPS) Switch	3287		SA	087100

Notes: Exterior doors and hardware to comply with FBC windstorm requirements.

**Set: 4.1**

Doors: M112.2

Description: Exterior Classroom Pair (Exit Only)

2 Continuous Hinge	CFMxxHD1		PE	087100
2 SVR Exit Device (exit only)	HC 43 8710	US32D	SA	087100
2 Door Closer	1431 CPS	EN	SA	087100
2 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Threshold	2005AV x door width		PE	087100
1 Rain Guard	346C x door width plus 4"		PE	087100
1 Gasketing	303CS head & jambs		PE	087100
2 Sweep	315CN x door width		PE	087100
2 Astragal	303CS TKSP		PE	087100
2 (DPS) Switch	3287		SA	087100

Notes: Exterior doors and hardware to comply with FBC windstorm requirements.

**Set: 5.0**

Doors: M118.1, M119.1, W113.1

Description: Exterior Elec / Mech Pair (Lockset - Card Access - WiFi)

2	Continuous Hinge	CFMxxHD1		PE	087100
2	Flush Bolt	556WS	US26D	RO	087100
1	Dust Proof Strike	570	US26D	RO	087100
1	Access Control Mort Lock (WiFi)	IN120-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1	Degree Cylinder	as required		SA	087100
2	Door Closer	1431 CPS	EN	SA	087100
2	Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1	Threshold	2005AV x door width		PE	087100
1	Rain Guard	346C x door width plus 4"		PE	087100
1	Gasketing	303CS head & jambs		PE	087100
2	Sweep	315CN x door width		PE	087100

Notes: Astragal by door manufacturer.

-Exterior doors and hardware to comply with FBC windstorm requirements.

**Set: 6.0**

Doors: W114A.1

Description: Exterior Storage (Card Access - WiFi)

1	Continuous Hinge	CFMxxHD1		PE	087100
1	Access Control Mort Lock (WiFi)	IN120-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1	Degree Cylinder	as required		SA	087100
1	Door Closer	1431 CPS	EN	SA	087100
1	Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1	Threshold	2005AV x door width		PE	087100
1	Rain Guard	346C x door width plus 4"		PE	087100
1	Gasketing	303CS head & jambs		PE	087100
1	Sweep	315CN x door width		PE	087100

Notes: Exterior doors and hardware to comply with FBC windstorm requirements.

**Set: 7.0**

Doors: M106.1

Description: Exterior Receiving (Card Access - PoE)

1	Continuous Hinge	CFMxxHD1 PT		PE	087100
1	Access Control Mort Lock (PoE)	IN220-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1	Degree Cylinder	as required		SA	087100
1	Door Closer	1431 CPS	EN	SA	087100
1	Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1	Threshold	2005AV x door width		PE	087100
1	Rain Guard	346C x door width plus 4"		PE	087100
1	Gasketing	303CS head & jambs		PE	087100
1	Sweep	315CN x door width		PE	087100
1	ElectroLynx Harness	PoE-CEPT30RJ		MK	281300
1	Electric Power Transfer	CEPT-NW		SU	281300

Notes: Exterior doors and hardware to comply with FBC windstorm requirements.

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**Set: 8.0**

Doors: W100.3

Description: Corridor (Card Access - PoE)

3 Hinge	TA2714	US26D	MK	087100
1 Access Control Mort Lock (PoE)	IN220-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Door Closer	1431 UO	EN	SA	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
1 Smoke Gasketing	S773D		PE	087100
1 ElectroLynx Harness	PoE-CEPT30RJ		MK	281300
1 Electric Power Transfer	CEPT-NW		SU	281300

Notes: POE lock has an integrated card reader, DPS and RX. Doors are normally closed and locked. Outside lever rigid except when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Locks to be programmed Fail Secure, upon power failure, locks will remain in a locked state.

**Set: 9.0**

Doors: W101.1

Description: EMT Lab (Card Access - PoE)

3 Hinge (heavy weight)	T4A3786	US26D	MK	087100
1 Access Control Mort Lock (PoE)	IN220-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Door Closer	1431 P10	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
3 Silencer	608		RO	087100
1 ElectroLynx Harness	PoE-CEPT30RJ		MK	281300
1 Electric Power Transfer	CEPT-NW		SU	281300

Notes: POE lock has an integrated card reader, DPS and RX. Doors are normally closed and locked. Outside lever rigid except when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Locks to be programmed Fail Secure, upon power failure, locks will remain in a locked state.

**Set: 10.0**

Doors: W102.1, W103.1, W116.1, W118.1

Description: Classroom (Card Access - PoE)

3 Hinge	TA2714	US26D	MK	087100
1 Access Control Mort Lock (PoE)	IN220-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Door Closer	1431 UO	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
3 Silencer	608		RO	087100
1 ElectroLynx Harness	PoE-CEPT30RJ		MK	281300
1 Electric Power Transfer	CEPT-NW		SU	281300

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Notes: POE lock has an integrated card reader, DPS and RX. Doors are normally closed and locked. Outside lever rigid except when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Locks to be programmed Fail Secure, upon power failure, locks will remain in a locked state.

**Set: 11.0**

Doors: M111.1, M112.1, M115.1

Description: Large Classroom (Card Access - PoE)

3 Hinge (heavy weight)	T4A3786	US26D	MK	087100
1 Access Control Rim Exit (PoE)	43 IN220-8877 ETMD Less Cyl	US32D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Door Closer	1431 P10	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
1 Smoke Gasketing	S773D		PE	087100
1 ElectroLynx Harness	PoE-CEPT30RJ		MK	281300
1 Electric Power Transfer	CEPT-NW		SU	281300

Notes: POE device has an integrated card reader, DPS and RX. Doors are normally closed and locked. Outside lever rigid except when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Device to be programmed Fail Secure, upon power failure, door will remain locked.

**Set: 12.0**

Doors: W100C.1

Description: Corridor (Card Access - WiFi)

3 Hinge	TA2714	US26D	MK	087100
1 Access Control Mort Lock (WiFi)	IN120-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Door Closer	1431 UO	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
3 Silencer	608		RO	087100

Notes: WiFi lock has an integrated card reader, DPS and RX. Doors are normally closed and locked. Outside lever rigid except when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Locks to be programmed Fail Secure, upon power failure, locks will remain in a locked state.

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**Set: 13.0**

Doors: M101A.1, M102.1, M103.1, M104.1, M105.1, M106.2, M108.1, M109.1, M110.1, M113.1, M114.1, M116.1, W101D.1, W109.1, W110.1, W111.1, W112.1, W114.1, W115.1

Description: Various Single (Card Access - WiFi)

3 Hinge	TA2714	US26D	MK	087100
1 Access Control Mort Lock (WiFi)	IN120-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Door Closer	1431 UO	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
3 Silencer	608		RO	087100

Notes: WiFi lock has an integrated card reader, DPS and RX. Doors are normally closed and locked. Outside lever rigid except when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Locks to be programmed Fail Secure, upon power failure, locks will remain in a locked state.

**Set: 14.0**

Doors: W117.1

Description: Storage Pair (Card Access - WiFi)

6 Hinge	TA2714	US26D	MK	087100
1 Dust Proof Strike	570	US26D	RO	087100
2 Flush Bolt	555	US26D	RO	087100
1 Access Control Mort Lock (WiFi)	IN120-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Surface Overhead Stop	9-X36	652	RF	087100
1 Door Closer	1431 CPS	EN	SA	087100
2 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
2 Silencer	608		RO	087100

Notes: Install overhead stop at the inactive leaf  
 WiFi lock has an integrated card reader, DPS and RX. Doors are normally closed and locked. Outside lever rigid except when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Locks to be programmed Fail Secure, upon power failure, locks will remain in a locked state.

**Set: 15.0**

Doors: W101D.2

Description: Storage UNEQUAL Pair (Card Access - PoE)

6 Hinge	TA2714	US26D	MK	087100
1 Dust Proof Strike	570	US26D	RO	087100
2 Flush Bolt	555	US26D	RO	087100
1 Access Control Mort Lock (PoE)	IN220-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Surface Overhead Stop	9-X36	652	RF	087100
1 Door Closer	1431 CPS	EN	SA	087100
2 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
2 Silencer	608		RO	087100
1 ElectroLynx Harness	PoE-CEPT30RJ		MK	281300
1 Electric Power Transfer	CEPT-NW		SU	281300

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Notes: Astragal by door manufacturer  
 Install overhead stop at the inactive leaf

POE lock has an integrated card reader, DPS and RX. Doors are normally closed and locked. Outside lever rigid except when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Locks to be programmed Fail Secure, upon power failure, locks will remain in a locked state.

**Set: 16.0**

Doors: M105A.1, W108.1  
 Description: Janitor (Card Access - WiFi)

3 Hinge	TA2714	US26D	MK	087100
1 Access Control Mort Lock (WiFi)	IN120-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Door Closer	1431 UO	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
1 Smoke Gasketing	S773D		PE	087100

Notes: WiFi lock has an integrated card reader, DPS and RX. Doors are normally closed and locked. Outside lever rigid except when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Locks to be programmed Fail Secure, upon power failure, locks will remain in a locked state.

**Set: 17.0**

Doors: M117.1, W106.1  
 Description: MDF (PoE Keypad)

3 Hinge	TA2714	US26D	MK	087100
1 Access Control Lock (PoE Keypad)	S1-82276 IKMD Less Cyl	US26D	SA	281300
1 Degree Cylinder	as required		SA	087100
1 Door Closer	1431 UO	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
3 Silencer	608		RO	087100
1 ElectroLynx Harness	PoE-CEPT30RJ		MK	281300
1 Electric Power Transfer	CEPT-NW		SU	281300

Notes: POE lock has an integrated card reader, keypad, DPS and RX. Doors are normally closed and locked. Outside lever rigid except with valid keycode or when valid credential presented to allow entry. Mechanical key override will retract latchbolt. Always free egress. Locks to be programmed Fail Secure, upon power failure, locks will remain in a locked state.

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**Set: 18.0**

Doors: W101A.1, W101B.1, W101C.1  
 Description: EMT Simulator Rooms

3 Hinge (heavy weight)	T4A3786	US26D	MK	087100
1 Office Lock	DG160 28 10G05 LL	US26D	SA	087100
1 Core	DG1 6300		SA	087100
1 Surface Overhead Stop	9-X36	652	RF	087100

**Set: 19.0**

Doors: M100B.1, M100C.1, W104.1, W105.1  
 Description: Restroom

3 Hinge (heavy weight)	T4A3786	US26D	MK	087100
1 Passage Latch	28 10U15 LL	US26D	SA	087100
1 Door Closer	1431 P10	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
3 Silencer	608		RO	087100

**Set: 20.0**

Doors: M107.1  
 Description: Staff Lounge

3 Hinge	TA2714	US26D	MK	087100
1 Passage Latch	28 10U15 LL	US26D	SA	087100
1 Door Closer	1431 UO	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
3 Silencer	608		RO	087100

**Set: 21.0**

Doors: M100D.1  
 Description: Toilet

3 Hinge	TA2714	US26D	MK	087100
1 Privacy Lock	28 10U65 LL	US26D	SA	087100
1 Door Closer	1431 UO	EN	SA	087100
1 Kick Plate	K1050 8" x 2"LDW	US32D	RO	087100
1 Door Stop	442 or 409 as required	US26D	RO	087100
3 Silencer	608		RO	087100



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**Set: 22.0**

Doors: MISC

Description: ATTIC STOCK

2 Access Control Mort Lock (PoE)	IN220-7976 IP MB LNMD Less Cyl	US26D	SA	281300
2 Access Control Mort Lock (WiFi)	IN120-7976 IP MB LNMD Less Cyl	US26D	SA	281300
1 Access Control Rim Exit (PoE)	43 IN220-8877 ETMD Less Cyl	US32D	SA	281300
2 ElectroLynx Harness	PoE-CEPT30RJ		MK	281300
1 Cable Tester	DHTA		SA	281300
2 Electric Power Transfer	CEPT-NW		SU	281300
1 CD Tool Kit	WFCD1		SA	281300

Hardware Index

Mark	Usage	Hardware
M100.1	EXT FROM LOBBY	1.0
M100B.1	MENS RESTROOM	19.0
M100C.1	WOMENS RESTROOM	19.0
M100D.1	TOILET	21.0
M101.1	EXT FROM READING AREA	4.0
M101A.1	CIRCULATION DESK	13.0
M102.1	OFFICE	13.0
M103.1	OFFICE	13.0
M104.1	OFFICE	13.0
M105.1	LOBBY FROM OFFICE	13.0
M105A.1	CUSTODIAL	16.0
M106.1	EXT FROM RECEIVING	7.0
M106.2	CIRCULATION DESK	13.0
M107.1	STAFF LOUNGE	20.0
M108.1	GROUP STUDY	13.0
M109.1	QUIET STUDY	13.0
M110.1	OFFICE	13.0
M111.1	WRITING CENTER	11.0
M111.2	EXT FROM WRITING CENTER	4.0
M112.1	LIBRARY INSTRUCTION ROOM	11.0
M112.2	EXT FROM LIBRARY INSTRUCTION	4.1
M113.1	QUIET STUDY	13.0
M114.1	OFFICE	13.0
M115.1	ACADEMIC STUPPORT CENTER	11.0
M115.2	EXT FROM ACADEMIC SUPPORT	4.0

M116.1	STORAGE	13.0
M117.1	MDF	17.0
W100.1	EXT FROM LOBBY	1.0
W100.3	CORRIDOR	8.0
W100A.1	EXT FROM CORRIDOR	2.0
W100B.1	EXT FROM CORRIDOR	3.0
W100C.1	CORRIDOR FROM CORRIDOR	12.0
W101.1	CORRIDOR FROM EMT LAB	9.0
W101.2	EXT FROM EMT LAB	4.0
W101A.1	EMT 1 - SIMULATOR	18.0
W101B.1	EMT 2 - SIMULATOR	18.0
W101C.1	EMT 3 - SIMULATOR	18.0
W101D.1	EMT LAB TO STORAGE	13.0
W101D.2	CORRIDOR FROM STORAGE	15.0
W102.1	CLASSROOM	10.0
W103.1	CLASSROOM	10.0
W104.1	WOMENS RESTROOM	19.0
W105.1	MENS RESTROOM	19.0
W106.1	MDF	17.0
W108.1	CUSTODIAL	16.0
W109.1	OFFICE	13.0
W110.1	OFFICE	13.0
W111.1	OFFICE	13.0
W112.1	OFFICE	13.0
W113.1	EXT FROM MECH/ELEC	5.0
W114A.1	EXT FROM STORAGE	6.0
W114.1	OFFICE	13.0
W115.1	OFFICE	13.0
W116.1	CLASSROOM	10.0
W117.1	CORRIDOR FROM STORAGE	14.0
W118.1	CLASSROOM	10.0
M118.1	EXT FROM MECH/ELEC	5.0
M119.1	EXT FROM MECH/ELEC	5.0

END OF SECTION 08 71 00

**St. Johns River State Access Control / Div 8 / EC Division of Responsibility Matrix**

**Orange Park Library Renovation & Addition**

Item of Work	Equipment Furnished By	Equipment Installed By	Conduit / Wire By	Electrical Terminations By	SEC Integration	Notes
Door Power Supplies	Div 8	EC	EC	EC / SEC	NA	High Voltage by EC, Low Voltage Terminations by SEC
120 VAC Power to Door Power Supplies and Security Panels	EC	EC	EC	EC	NA	
Security Panels / Access Controllers	SEC	SEC	* SEC	SEC	SEC	*120 VAC by EC
Card Readers	SEC	SEC	EC / SEC	SEC	SEC	EC To provide conduit paths to Readers, SEC to install and terminate card readers.
Door Hardware - ElectricTransfer Hinges / Cables w/Molex connectors / Wiring harnesses / Push Bars	Div 8	Div 8	EC	See note on right	NA	EC To provide conduit paths to Hinges, Div 8 to install cables with molex at door, Sec to make connections above door.
Door Position Switches	SEC	SEC	* EC / SEC	SEC	SEC	*EC To provide conduit paths to DPS's
WIFI Locksets (IN120)	SEC	Div 8	NA	NA	SEC	<b>Div 8 Installer Must be ASSA Certified to Maintain Warranty</b>
POE Lock Sets (IN220)	SEC	Div 8	EC	Div 8	SEC	<b>Div 8 Installer Must be ASSA Certified to Maintain Warranty</b>
Lock Cylinders	Div 8	Div 8	NA	NA	NA	
Automatic Door Opener / Handicapped Push Buttons	Div 8	Div 8	EC / Div 8	EC / Div 8	SEC	SEC to add relay where necessary to disable Autodoor on hardwired doors with Card Access. (Kill Switch input)
Fire Alarm Interface	FIR / EC	FIR / EC	FIR / EC	FIR / EC	NA	Fire Alarm Shutdown as needed per Arch/Engr Direction
Campus Door Lockdown System	SEC	SEC	SEC	SEC	SEC	
Update Vantage Point Software / Graphical Interface to reflect new doors	SEC	NA	NA	NA	SEC	
Programming & Integration between BMS , SEC, & Alertus	NA	NA	NA	NA	SEC	
Shop Drawings and Record Drawings on System	SEC	NA	NA	NA	NA	
Strengthening of WIFI Signal as needed	OWN	OWN	OWN	OWN	NA	

Contractor	Abbr
Division 8 Contractor	Div 8
Electrical Contractor	EC
Access Control Systems Integrator	SEC
Fire Alarm Contractor	FIR
St Johns River State College	OWN
Not Applicable	NA

**NOTES:**

\*\* Doors to be ordered pre-prepped with holes for DPS's



## SECTION 08 71 13 – AUTOMATIC DOOR OPERATORS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Exterior and interior, swinging door automatic operators.

#### 1.3 REFERENCES

- A. ANSI A117.1 – Accessible and Usable Buildings and Facilities.
- B. ANSI A156.19 – Power Assist & Low Energy Power Operated Doors.
- C. AAADM – American Association of Automatic Door Manufacturers.
- D. NFPA 70 – National Electrical Code.
- E. NFPA 101 – Life Safety Code.
- F. CPSC 16 CFR 1201 – Safety Standard for Architectural Glazing Materials.
- G. ANSI/BHMA A156.5 – Standard for Auxiliary Locks and Associated Products.
- H. ANSI/BHMA A156.10 – Standard for Power Operated Pedestrian Doors.
- I. ANSI Z97.1 – Standards for Safety Glazing Material Used in Buildings.
- J. UL 325 – Standard for Safety for Door, Drapery, Gate, Louver and window Operators and Systems.
- K. American Association of Automatic Door Manufacturers (AAADM).
- L. UL991 – Standard for Tests for Safety-Related Controls Employing Solid-State Devices.
- M. ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- N. ASTM B209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- O. ASTM B244 – Standard Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments.
- P. AAMA 607.1 – Clear Anodic Finishes for Architectural Aluminum.
- Q. AAMA 611 – Voluntary Specification for Anodized Architectural Aluminum.
- R. AAMA 701 – Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals.
- S. NAAMM – Metal Finishes Manual for Architectural Metal Products.
- T. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for automatic entrances.
  - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For automatic entrances.
  - 1. Include plans, elevations, sections, hardware mounting heights, and attachment details.
  - 2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 3. Include diagrams for power, signal, and control wiring.
  - 4. Indicate locations of activation and safety devices.
  - 5. Include hardware schedule and indicate hardware types, functions, quantities, and locations.
- C. Delegated-Design Submittal: Submit design calculations, analysis data and shop drawings indicating compliance with dedicated design requirements signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.
- D. Approvals: Manufacturer submit documentation that product complies with criteria and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of automatic entrance. Include emergency-exit features of automatic entrances serving as a required means of egress.
- C. Product Test Reports: For each type of automatic entrance, for tests performed by a qualified testing agency.
- D. Sample Warranties: For manufacturer's special warranties.

#### 1.6 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.
- B. Pre-installation Dimension check: Field verify dimensions prior to manufacturing door.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For automatic entrances, safety devices, and control systems to include in operation and maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer with company certificate issued by AAADM indicating that manufacturer has a Certified Inspector on staff.
- B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project and who employs a Certified Inspector.
- C. Manufacturer certified provider to install operator in accordance with current ANSI A156.19, ANSI 117.1, NFPA 101 and local applicable codes. The system fulfills Americans with Disabilities Act (ADA) requirements for barrier free entrances. All door openings must be at least 36" wide to comply.
- D. Certified Inspector Qualifications: Certified by AAADM.

1.9 FIELD CONDITIONS

- A. Coordination
  - 1. Coordinate sizes and locations of recesses in concrete floors for recessed control mats that control automatic entrances. Concrete, reinforcement, and formwork requirements are specified elsewhere.
  - 2. Templates: Distribute for doors, frames, and other work specified to be factory prepared for installing automatic entrances.
  - 3. Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish. Coordinate hardware for automatic entrances with hardware required for rest of Project.
  - 4. Electrical System Roughing-in: Coordinate layout and installation of automatic entrances with connections to power supplies and access-control system.
  - 5. Coordinate sizes and dimension.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of automatic entrances that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including, but not limited to, excessive deflection.
    - b. Faulty operation of operators, controls, and hardware.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
  - 2. Warranty Period: Two (2) years from date of Substantial Completion.
- B. Verify available special finish warranties with manufacturers. Extended 20-year finish warranties are sometimes available for 70 percent fluoropolymer coatings.
- C. Special Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail in materials or workmanship within specified warranty period.
  - 1. Deterioration includes, but is not limited to, the following:

- a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
  - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
  - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
2. Warranty Period: Two (2) years from date of Substantial Completion.

#### 1.11 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Automatic entrances shall withstand the effects of gravity loads and the loads and stresses within limits and under conditions indicated according to ASCE 7.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes with temperature changes 120 deg F, ambient; 180 deg F, material surfaces.
- C. Opening Force:
1. Power-Operated Doors: In case of power loss, door needs to open per applicable codes.
  2. Breakaway Device for Power-Operated Doors: Not more than 50 lbf required for a breakaway door or panel to open.
- D. Entrapment-Prevention Force:
1. Power-Operated Swinging Doors: Not more than 30 lbf required to prevent stopped door from closing.
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- F. Power-Operated Door Standard: BHMA A156.10.
- G. Delegated-Design: Provide design services, calculations and shop drawings for delegated design requirements complying with code requirements, performance requirements and design criteria signed and sealed by an engineer registered in the State of Florida.
- H. Approvals: Manufacturer shall certify that product complies with criteria and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
1. Besam US, Inc.



## 2.2 GENERAL

- A. General: Provide manufacturer's standard automatic entrances including doors, framing, headers, door operators, controls, and accessories required for a complete installation.
- B. Swinging, Power-Operated Automatic Entrance
  - 1. Configuration: Refer to drawing for configuration location and dimensions.
    - a. Traffic Pattern: One way, egress.
    - b. Mounting: Between jambs.

## 2.3 AUTOMATIC ENTRANCES

- A. Basis of Design: "SW200i Automatic Swing Door Operator"
- B. Operator: Electro-mechanical operator, powered by 24 volt, 1/8 hp motor. Operator is non-handed to insure maximum versatility in adapting to varying field conditions and shall include a replaceable internal door stop. Spring shall be adjustable to compensate for different manual push forces required on varying door widths.
- C. Operator Housing: Non-handed operator is completely contained in a 5-3/16" deep x 4 -5/16" high extruded aluminum housing. All aluminum sections are 6063-T5 alloy and all structural walls have a minimum thickness of .156".
  - 1. Supply full 2 motor covers for paired door openings utilizing 1 single operator motor assembly.
- D. Electronic Controls: Microprocessor controlled unit shall control the operation and switching of the swing power operator. The electronic control provides low voltage power supply for all means of actuation. No external or auxiliary low voltage power source will be allowed. The controls include time delay (1.5 to 30 seconds) for normal cycle.
- E. Connecting Hardware: Surface mounted operator is connected to the door by means of a steel door arm. The door arm is secured to the top rail of the swing door using one piece threaded tubular inserts for aluminum doors, 1/4-20 binding head and post screws (sex bolts) for wood and hollow metal doors. The knurled door arm adaptor is broached for positive engagement with the shaft and requires no additional linkage, slide blocks or tracks. The appearance of the top rail of the swing door shall be modified in order to attach the door arm.
- F. Power Open: When an opening signal is received by the control unit, the door shall be opened at the operator-adjusted opening speed. Before the door is fully open at back check, it slows automatically to low speed. The motor stops when the selected door opening angle has been reached. The open position is held by the motor. If the door is obstructed while opening, it will either stop or reverse.
- G. Power Close: Closing shall be provided by means of clock spring and motor. When the hold open time has elapsed, the operator will close the door automatically, using spring force and motor. The door will slow to low speed at latch check before it reaches the fully closed position. The door is kept closed by spring power or extended closing force by the motor.
- H. Power Assist: Operator can be adjusted to lower the open forces when used manually. Power Assist will be active only while pushing or pulling the door and will allow the door to close when an opening force is no longer applied to the door.

- I. Electronic Dampening: Operator to include standard electric dampening system which automatically counteracts additional forces applied to the door during the opening or closing cycle by reducing door speed.
- J. Stack Pressure Consumption: Electronic control allows for increases of forces to overcome minor stack pressures. The control automatically compensates for lower manual push forces when the door is used in manual mode in order to comply with ANSI A156.19.
- K. Lock retry circuit: If locking is unsuccessful when the door reaches the closed position, the operator will automatically reverse open 10 degrees and reclose in an attempt to successfully lock the door.
- L. Test of Safety Sensors: If optional safety sensors are specified, SW100 operator monitors the sensors before opening and closing the door. If sensors are not functioning properly, automation is de-activated and the door will function as a manual swing door with a door closer.
- M. Breakaway Device for Power-Operated Doors: Device that allows door to swing out in direction of egress to full 90 degrees from any operating position. Maximum force to open door shall be as stipulated in "Performance Requirements" Article. Interrupt powered operation of door operator while in breakaway mode.
- N. Deadlocks: Per hardware schedule.
  - 1. Cylinders: Per hardware schedule.
    - a. Keying: Integrate into building master key system.

## 2.4 PUSH PLATE CONTROL DEVICE

- A. Actuation device is either:
  - 1. Radio controlled, 6" round stainless steel push plate switches engraved with blue handicap logo.
  - 2. Control causes door to open instantly when press wall switch is pushed. Door can be used as a manual door with no damage to the operator.
  - 3. Option: Push to Activate - is a programmable feature. Push or pull the door open from any position, and the door will gently power open, time out and slowly close.

## 2.5 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Electrical Characteristics and Components: Nominal current draw 75 watts. Low Power Consumption: Average electrical power required to open and close a 36", 200 lb. door is 25 W. Control unit has a high efficient power supply and optimized door control with a maximum power consumption of 75 W.
- B. Overload Protection: Electric motor is equipped standard with a built-in thermal overload protection and cannot exceed 10 amps current draw.

## 2.6 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Extrusions: ASTM B 221.
- B. Steel Reinforcement: Reinforcement with corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Use surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
- C. Glazing: As specified in specification section "Glazing."
- D. Sealants and Joint Fillers: As specified in specification section "Joint Sealants."
- E. Nonmetallic, shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, non-staining, grout; complying with ASTM C 1107/C 1107M; of consistency suitable for application.
- F. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- G. Fasteners and Accessories: Corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.

## 2.7 FABRICATION

- A. General: Factory fabricate automatic entrance components to designs, sizes, and thicknesses indicated and to comply with indicated standards.
  1. Form aluminum shapes before finishing.
  2. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
  3. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws fabricated from stainless steel.
    - a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
    - b. Reinforce members as required to receive fastener threads.
  4. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
- B. Framing: Provide automatic entrances as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.
  1. Fabricate tubular and channel frame assemblies with welded or mechanical joints. Provide subframes and reinforcement as required for a complete system to support required loads.
  2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
  3. Form profiles that are sharp, straight, and free of defects or deformations.
  4. Provide components with concealed fasteners and anchor and connection devices.
  5. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
  6. Fabricate exterior components to drain condensation and water passing joints within system to the exterior.

7. Provide anchorage and alignment brackets for concealed support of assembly from building structure.
  8. Allow for thermal expansion of exterior units.
- C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.
- D. Metal Cladding: Factory-fabricated and installed metal cladding, completely covering all visible surfaces as part of prefabricated entrance assembly before shipment to Project site.
1. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
  2. Form profiles that are sharp, straight, and free of defects or deformations.
  3. Provide components with concealed fasteners and anchor and connection devices.
  4. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
  5. Fabricate exterior components to drain water passing joints and condensation and moisture occurring or migrating within system to the exterior.
  6. Allow for thermal expansion at exterior entrances.
- E. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.
1. Door Operator Performance: Door operators shall open and close doors and maintain them in fully closed position when subjected to Project's design wind loads.
  2. Electromechanical Operators: Overhead unit powered by fractional-horsepower, permanent-magnet dc motor; with closing speed controlled mechanically by gear train and dynamically by braking action of electric motor; with solid-state microprocessor controller; UL 325; and with manual operation with power off.
- F. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."
- G. Hardware: Factory install hardware to greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.
1. Provide sliding-type weather stripping, mortised into door, at perimeter of doors and breakaway sidelites.
  2. Provide compression-type weather stripping at fixed stops of exterior doors. At locations without fixed stops, provide sliding-type weather stripping retained in adjustable strip mortised into door edge.
  3. Provide weather sweeps mounted to underside of door bottoms of exterior doors.
  4. Provide finger guards at each swinging-door leaf that has clearance at hinge side greater than 1/4 inch and less than 3/4 inch with door in any position. Anchor guards to hinge-jamb frame.
- H. Controls:
1. General: Factory install activation and safety devices in doors and headers as required by BHMA A156.10 for type of door and direction of travel.
  2. Install photoelectric beams in sides of guide rails, with dimension above finished floor not less than 24 inches.

## 2.8 FINISHES

- A. Aluminum Surfaces: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- B. Aluminum Surfaces: Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- E. High-Performance Organic Finish Three-Coat Fluoropolymer: Chemical Finish Organic Coating, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight. Complying with paint manufacturer's written instructions for cleaning, preparing, pretreating and apply coating to exposed metal surfaces to comply with AAMA 2605.
  - 1. Color and Gloss: As selected by Architect from full range of industry colors and color densities.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrances.
- B. Examine roughing-in for electrical systems to verify actual locations of power connections before automatic entrance installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Install automatic entrances according to manufacturer's written instructions and cited BHMA standard for direction of pedestrian travel, including signage, controls, wiring, and connection to the building's power supply.
  - 1. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints. Seal joints watertight.
  - 2. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
  - 3. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous coating.

- B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
  - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
  - 2. Set headers, operating brackets, and guides level and true to location with anchorage for permanent support.
  - 3. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.
  - 4. Provide thresholds at exterior doors and where indicated.
- C. Door Operators: Connect door operators to electrical power distribution system.
- D. Controls: Install and adjust activation and safety devices according to manufacturer's written instructions and cited BHMA standard for direction of pedestrian travel. Connect control wiring according to Section 26 05 19 "Low-Voltage Electrical Power Conductors and Cables."
- E. Sealants: Comply with requirements specified in specification section "Joint Sealants" to provide weathertight installation.
  - 1. Set thresholds, framing members, and flashings in full sealant bed.
  - 2. Seal perimeter of framing members with sealant.
- F. Signage: Apply signage on both sides of each door and breakaway sidelite as required by cited BHMA standard for direction of pedestrian travel.
- G. Wiring within Automatic Entrance Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's written limitations on bending radii. Provide and use lacing bars and distribution spools.

### 3.3 FIELD QUALITY CONTROL

- A. Certified Inspector: Owner will engage a Certified Inspector to test and inspect components, assemblies, and installations, including connections.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
  - 1. Test and inspect each automatic entrance, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards.
- C. Automatic entrances will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

### 3.4 ADJUSTING

- A. Adjust hardware, moving parts, door operators, and controls to function smoothly, and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.
  - 1. Adjust exterior doors for weathertight closure.

3.5 CLEANING

- A. Clean glass and metal surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.

3.6 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of automatic entrance Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper automatic entrance operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
  - 1. Engage a Certified Inspector to perform safety inspection after each adjustment or repair and at end of maintenance period. Furnish completed inspection reports to Owner.
  - 2. Perform maintenance, including emergency callback service, during normal working hours.
  - 3. Include 24-hour-per-day, 7-day-per-week, emergency callback service.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain automatic entrances.

END OF SECTION 08 71 13





## SECTION 08 80 00 – GLAZING

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Glazing for:
    - i. Window units.
    - ii. Storefront systems.
    - iii. Doors vision lites.
    - iv. Interior borrowed lites.
    - v. Fire-resistive lites.
    - vi. Wall mirrors.
    - vii. One-way lites.
    - viii. Custom window graphics.

#### 1.3 REFERENCES

- A. ASCE-7 – Minimum Design Loads for Buildings and other Structures.
- B. ANSI Z97.1 – Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- C. ASTM C864 – Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- D. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.
- E. ASTM C1036 – Standard Specification for Flat Glass.
- F. ASTM C1048 – Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
- G. ASTM C1172 – Standard Specification for Laminated Architectural Safety Glass.
- H. ASTM C 1503 – Standard Specification for Silvered Flat Glass Mirror.
- I. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- J. ASTM E152 – Methods for Fire Test of Door Assemblies.
- K. ASTM E163 – Methods for fire Test of Window Assemblies.
- L. ASTM E283 – Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
- M. ASTM E330 – Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- N. ASTM E1996 – Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

- O. ASTM E2025 – Standard Test Method for Evaluating Fenestration Components and Assemblies for Resistance to Impact Energies.
- P. CPSC 16 CFR 1201 Safety Standards for Architectural Glazing Materials.
- Q. GANA – Glazing Manual.
- R. GANA – Laminated Glazing Reference Manual.
- S. FGMA – Sealant Manual.
- T. NFPA 80 – Standard for Fire Doors and Fire Windows.
- U. NFPA 252 – Standard Methods of Fire Test of Doors Assemblies.
- V. NFPA 257 – Standards on Fire Test of Window and Glass Block Assemblies.
- W. LSGA – LSGA Design Guide.”
- X. SIGMA – TM-3000 “Vertical Glazing Guidelines” and TB-3001 “Sloped Glazing Guidelines.”
- Y. SGCC – Safety Glazing Certification Council.
- Z. FBC – Florida Building Code.

#### 1.4 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's directions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated glass standard.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Shop Drawings: Glazing Schedule of all openings indicating glass type, thickness, opening size and location. Schedule shall be submitted with shop drawings.
- C. Glass Samples: For each type of glass product in a 12 inches square sample.
- D. Glazing Accessory Samples: For sealants, in 12-inch lengths.
- E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on drawings.
- F. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

- G. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500-mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.6 INFORMATION SUBMITTALS

- A. Qualification Data: For installers, manufacturers of laminated, insulating-glass units, low-e coatings, glass testing agency and sealant testing agency.
- B. Product Certificates: For glass and glazing products, from manufacturer.
- C. Product Test Reports: For glass and each type of glazing sealant and gasket indicated, evidencing compliance with requirements specified.
- D. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- E. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed for adhesion.
- F. Compatibility Test Report: From manufacturer of insulating glass edge sealant indicating that glass edge sealants were tested for compatibility with other glazing materials including sealants, glazing tape, gaskets, setting blocks, and edge blocks.
- G. Draft Warranties.

#### 1.7 PRE-INSTALLATION CONFERENCE

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  2. Review temporary protection requirements for glazing during and after installation.

1.8 MOCKUPS

- A. Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.
- B. Install glazing in mockups specified in the project manual to match glazing systems required for Project, including glazing methods.
- C. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 QUALITY ASSURANCE

- A. Comply with applicable codes and regulations and with the Consumer Product Safety Commission CPSC 16 CFR 1201 and with applicable recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual."
- B. Manufacturer Qualifications: Provide products from only manufacturers with at least five (5) years experience making the specified materials as a current catalog and regular production item.
- C. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program. Employ only experienced Contractors (installers) skilled in the successful installation of the specified materials and assemblies on similar projects for a minimum of five (5) years.
- D. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- E. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- F. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
    - a. Provide labels showing glass manufacturer's identity, type of glass, thickness, and quality. Labels shall remain on glass until it has been set.
- G. All clear tempered safety glass must have permanently affixed labels for verification.
- H. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, quality and safety glazing standard with which glass complies.
  - 1. Safety glass mirrors must have permanently affixed labels for verification.

- I. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, whether glazing is for use in fire doors or other openings, whether or not glazing passes hose-stream test, whether or not glazing has a temperature rise rating of 450 deg F, and the fire-resistance rating in minutes.
  1. All fire rated glazing must have permanently affixed labels for verification.
- J. Laminated-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
  1. Comply with applicable codes and regulations and with the Consumer Product Safety Commission CPSC 16 CFR 1201 and with applicable recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual."

#### 1.10 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
  1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
  2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
  3. Test no fewer than eight samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
  4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
  5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

#### 1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver glass to site in suitable containers that will protect glass from the weather and from breakage. Carefully store material, as directed, in a safe place where breakage can be reduced to a minimum. Deliver sufficient glass to allow for normal breakage. Glazing compounds shall arrive at the project site in labeled containers which have not been opened.
- B. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- C. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.
- D. Protect glass edges from damage during handling and installation. Damaged glass is defined as glass with edge damage or other imperfections that could weaken the glass and impair performance and/or appearance if installed. Remove damaged glass and legally dispose of offsite.

1.12 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F.

1.13 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
  - 1. Warranty Period: Five (5) years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
  - 1. Warranty Period: Five (5) years from date of Substantial Completion.
- C. Manufacturer's Fire Glass Warranty: Submit manufacturer's standard warranty but not less than five (5) years from Date of Substantial Completion.
- D. Manufacturer's Mirror Warranty: Submit a written warranty executed by mirror manufacturer, agreeing to replace any mirrors that develop visible silver spoilage defects within a fifteen (15) year period of time.

1.14 PERFORMANCE REQUIREMENTS

- A. General: Installed exterior glazing systems shall withstand thermal movement and wind and impact loads in compliance product approval without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. General: Installed interior glazing systems shall withstand manufacturers design parameters for thermal movement and impact loads without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain airtight; deterioration of glazing materials; or other defects in construction.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
  2. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
  3. Glass Design: Glass thicknesses indicated on Drawings are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for the various size openings in the thicknesses and strengths (annealed or heat-treated) to meet or exceed the following criteria:
  4. Minimum glass thickness, nominally, of lites in exterior walls is 6.0 mm (0.23 inch).
  5. Tinted and heat-absorbing glass thicknesses for each tint indicated are the same throughout Project.
  6. Minimum glass thicknesses of lites, whether composed of annealed or heat-treated glass, are selected so the worst-case probability of failure does not exceed the following:
    - a. 8 lites per 1000 for lites set vertically or not over 15 degrees off vertical and under wind action. Determine minimum thickness of monolithic annealed glass according to ASTM E 1300. For other than monolithic annealed glass, determine thickness per glass manufacturer's standard method of analysis including applying adjustment factors to ASTM E 1300 based on type of glass.
    - b. 1 lite per 1000 for lites set over 15 degrees off vertical and under action of wind.
- D. Specific hazardous locations: The following shall be considered specific hazardous locations for purposes of glazing.
1. Glazing in ingress and means of egress doors.
  2. Glazing adjacent to a door and within the same wall plane as the door whose nearest vertical edge is within 24 inches of the door in a closed position and whose bottom edge is less than 60 inches above the floor or walking surface, unless an intervening interior permanent wall is between the door and the glazing.
  3. Glazing in fixed panels having a glazed area in excess of 9 square feet with the lowest edge less than 18 inches above the finish floor level or walking surface within 36 inches of such glazing, unless a horizontal member not less than 1-1/2 inches in width is located between 24 inches and 36 inches above the walking surface.

## PART 2 – PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer shall be the following in each category however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
- B. Primary Glass: Provide products from one of the following:
1. Vitro Architectural Glass (Formally PPG)
  2. Guardian
  3. OldCastle
  4. Pilkington
  5. AFGD (American Flat Glass Distributors)
- C. Architectural Glass Fabricators: Provide products from one of the following:

1. All of the above primary glass manufacturers.
2. Globe-Amerada Glass
3. Interpane High-Performance Glass Products
4. Tempglass
5. Viracon
6. Arch Amarlite

D. Fire Rated Glass:

1. SAFTI FIRST
2. Oldcastle Glass
3. Nippon Electric Glass Co., Ltd., distributed by Technical Glass Products.

E. Mirrors:

1. Arch Aluminum & Glass Co., Inc.
2. Gilded Mirrors, Inc.
3. National Glass Industries
4. Gardner Glass, Inc.

F. One-Way Glass:

1. Viracon
2. Pikington
3. PPG

G. Glass Film:

1. 3M
2. Decorative Films, LLC
3. Solex
4. Artscape

## 2.2 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.
- C. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
  1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- D. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
  1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.



- E. Pyrolytic-Coated, Low-Maintenance Glass: Clear float glass with a coating on first surface having both photocatalytic and hydrophilic properties that act to loosen dirt and to cause water to sheet evenly over the glass instead of beading.
- F. Ceramic Coated Glass Products: Shall comply with ASTM C 1048 Standard Specification for Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated, Condition B.
- G. Refer to requirements for glass units for performance characteristics of assembled units composed of tinted glass, uncoated, relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.

### 2.3 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
  - 1. Shall comply with ASTM E 546 Standard Test Method for Frost Point of Sealed Insulating Glass Units.
  - 2. Shall comply with ASTM E 576 Standard Test Method for Frost Point of Sealed Insulating Glass Units in the Vertical Position.
  - 3. Sealed Insulating Glass Units to be double sealed with a primary seal of polyisobutylene and a secondary seal of silicone.
    - a. The minimum thickness of the secondary seal shall be 1/16".
    - b. The target width of the primary seal shall be 5/32".
    - c. There shall be no voids or skips in the primary seal.
    - d. Gaps or skips between primary and secondary sealant are permitted to a maximum width of 1/16" by maximum length of 2" with gaps separated by at least 18". Continuous contact between the primary seal and the secondary seal is desired.
    - e. Both primary and secondary sealant adhesion shall exhibit continuous, tenacious adhesion to both glass and spacer contact areas.
  - 4. To provide a hermetically sealed and dehydrated space, lites shall be separated by an aluminum spacer with three bent corners and one keyed-soldered corner or four bent corners and one straight butyl injected zinc plated steel straight key joint.
- B. Spacer: Manufacturer's standard spacer material and construction with black finish.

### 2.4 ONE-WAY GLASS

- A. Laminated One-way Glass: ASTM C1036. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
  - 1. Construction: Laminate glass with 0.060" clear polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
  - 2. Subject Side: Provide 1/4" thick clear HS glass.
  - 3. Interlayer Color: Clear and located on the #2 side of the clear glass.
  - 4. Viewer Side: Provide 1/4" thick gray tint glass.
  - 5. Performance:
    - a. Light Transmittance: 4%
    - b. Reflection Out (Subject Side): 42%
    - c. Reflectance In (Observer Side): 12%

6. All laminated architectural safety glass shall conform with ANSI Z97.1 and CPSC 16 CFR 1201.
7. Laminated Glass products to be fabricated free of foreign substances and air or glass pockets in autoclave with heat plus pressure.

## 2.5 EXTERIOR GLASS TYPES

- A. Glazing to be used for all exterior glazing unless noted otherwise.
- B. (GL-3) Insulating Coated Glass to meet 2017 Florida Prescriptive Energy Code:
  1. 1" VE3-2M Insulating Coated Glass as manufactured by Viracon.
    - a. Exterior Glass Ply: 1/4" Gray tint tempered
    - b. Coating: VE-2M on #2 Surface
    - c. Space: 1/2" aluminum air filled black finish
    - d. Silicone: black
    - e. Interior Glass Ply: 1/4" Clear tempered
  2. Performance Requirements
    - a. Visible Light Transmittance: 35%
    - b. Exterior Reflectance: 6%
    - c. Winter U-Value: 0.29
    - d. Summer U-Value: 0.26
    - e. Shading Coefficient: 0.28
    - f. Solar Heat Gain Coefficient: 0.24
    - g. Light to Solar Gain Ratio: 1.46
- C. (GL-3A) Insulating Coated Glass with 3M Film to meet 2017 Florida Prescriptive Energy Code:
  1. 1" VE3-2M Insulating Coated Glass as manufactured by Viracon.
    - a. Exterior Glass Ply: 1/4" Gray tint tempered
    - b. Coating: VE-2M on #2 Surface
    - c. Space: 1/2" aluminum air filled black finish
    - d. Silicone: black
    - e. Applied Film: 3M film
    - f. Interior Glass Ply: 1/4" Clear tempered
  2. Performance Requirements
    - a. Visible Light Transmittance: 35%
    - b. Exterior Reflectance: 6%
    - c. Winter U-Value: 0.29
    - d. Summer U-Value: 0.26
    - e. Shading Coefficient: 0.28
    - f. Solar Heat Gain Coefficient: 0.24
    - g. Light to Solar Gain Ratio: 1.46
- D. (GL-4) Spandrel Glazing – See specification section 08 80 20.
- E. Custom Window Graphics: At locations on the exterior as indicated.

## 2.6 INTERIOR GLASS TYPES

- A. (GL-1) Glass for Interior Non-Rated Doors, Sidelights, Transoms, storefronts and Windows: 1/4-inch thick clear tempered glass.

- B. (GL-2) Glass for Interior Non-Rated Doors and Windows with Film: 1/4-inch thick clear tempered glass with film.
- C. Glass for Interior Fire Rated Doors and Windows: Fire rated glazing to comply with rating requirements.
- D. Large Mirrors: Where indicated on drawings.
- E. Glass for one-way glass locations.

## 2.7 INTERIOR ACOUSTICAL GLASS (GL-5)

- A. Interior Acoustical Glass
  - 1. Glass Ply 1: 1/4" Clear FT
  - 2. Airspace: 1/2" airspace black finish
  - 3. Glass Ply 2: 1/4" Clear FT
  - 4. Total Thickness; 1"

## 2.8 GLASS FILM

- A. Decorative Film
  - 1. Basis of Design: 3M.
  - 2. Design; As selected by the Architect

## 2.9 CUSTOM WINDOW GRAPHICS

- A. Basis of Design: "Custom Window Film & Graphics"
- B. Exterior Applied Film
  - 1. Size: As indicated on drawings.
  - 2. Design: As supplied by the Architect.
- C. Manufacturer: Glassfilm Enterprises, Inc.

## 2.10 FIRE-RESISTIVE GLAZING PRODUCTS

- A. Fire-resistive glazing products with an exposed surface film are not acceptable.
- B. Fire-Protection Rating: As required for the assembly in which glazing material is installed.
  - 1. Glazing for Fire-Rated Door Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.

2. Glazing for Fire-Rated Window Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.
- C. Impact Safety Rating: As required for the assembly in which glazing material is installed.
1. Glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.
  2. Glazing products shall be permanently marked with certification label of the Safety Glazing Certification Council or another certification agency or manufacturer acceptable to authorities having jurisdiction.
- D. Temperature-Rise Rating: As required for the assembly in which glazing material is installed.
1. In exit enclosures, building codes usually require that fire-rated door assemblies have labels denoting the fire-protection rating, showing the time period and the maximum allowed temperature-rise limit of 450 deg F on the unexposed face of the door after 30 minutes of fire exposure.
  2. When used in glazed walls, provide glazing that has a maximum transmitted temperature end point of not more than 450 deg F above ambient during standard fire-test exposure.
- E. Glazing Sealants for Fire-Resistive Glazing Products: Identical to products used in test assemblies to obtain fire-protection rating.
- F. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.
- G. Laminated Ceramic Glazing: Laminated glass made from 2 plies of clear, ceramic flat glass; 5/16-inch total nominal thickness; complying with testing requirements in 16 CFR 1201 for Category II materials.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Nippon Electric Glass Co., Ltd. (distributed by Technical Glass Products); FireLite Plus.
    - b. Schott North America, Inc.; Laminated Pyran Crystal
    - c. Vetrotech Saint-Gobain; SGG Keralite FR-L
- H. Laminated Glass with Intumescent Interlayers: Laminated glass made from multiple plies of uncoated, clear tempered float glass; with intumescent interlayers; complying with testing requirements in 16 CFR 1201 for Category II materials.
1. Basis-of-Design: "Superlite II-XL" as manufactured by SAFTI FIRST
  2. Products: Subject to compliance with requirements, provide one of the following:
    - a. InterEdge, Inc., a subsidiary of AFG Industries, Inc.; Pyrobel.
    - b. Pilkington Group Limited (distributed by Technical Glass Products); PyroStop.
    - c. SAFTI FIRST, a division of O'Keeffe's, Inc.
    - d. Vetrotech Saint-Gobain; SGG Contraflam N2 or SGG Swissflam N2.
  3. Rating: As indicated on the drawings and as required to comply with wall and door ratings.
  4. Wire glazing is not permitted.

## 2.11 MIRRORS

- A. Safety Glass Mirrors: Provide 1/4" thick annealed float glass mirrors with manufacturer applied safety tape applied to the back surface and complying with FS DD-G-1403, ANSI Z97.1-1984 CPSC16 CFR 1201 Category II.
- B. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror manufacturer and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.
- C. Trim: As manufactured by Schluter Systems L.P. Provide brushed stainless steel trim "Quadec" No. Q150EB at top, sides and bottoms of mirrored wall.
  - 1. Trim Adhesive: Trim manufacturers "Kerdi-Fix" adhesive.
- D. Edge: Polished.
- E. Mirror Glass Production and Fabrication
  - 1. Glass Coating: Coat second surface of glass, unless otherwise indicated, with glass coating system complying with FS DD-M-00411 requirements and consisting of successive layers of chemically deposited silver, electrically or chemically deposited copper, and manufacturer's standard protective organic coating.

## 2.12 ELASTOMERIC GLAZING SEALANTS

- A. General: Provide materials as recommended by the manufacturer for the required application and condition of installation in each case. Provide only compounds which are proven to be fully compatible with surfaces contacted.
- B. General:
  - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
- C. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

## 2.13 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
  - 1. AAMA 804.3 tape, where indicated.

2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

- B. Glazing Sealant for Fire-Resistant Glazing Products: Identical to product used in test assembly to obtain fire-resistive rating.

#### 2.14 GLAZING GASKETS

- A. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock strips, complying with ASTM C542, black.

- B. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:

1. Neoprene, ASTM C864.
2. EPDM, ASTM C864.
3. Silicone, ASTM C1115.
4. Thermoplastic polyolefin rubber, ASTM C1115.

#### 2.15 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.

- B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85 plus or minus 5.

- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side-walking).

- F. Compressible Filler Rod: Shall be closed-cell or waterproof jacketed rodstock of synthetic rubber or plastic foam with proven compatibility with sealants used. Rod shall be flexible and resilient with 5-10 PSI compression strength for 25 percent deflection.

#### 2.16 FABRICATION OF GLASS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

- B. Clean cut or flat grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.
- C. Grind smooth and polish exposed glass edges and corners.

## 2.17 ENVIRONMENTAL

- A. Structural Sealant: ASTM C 1184, single-component neutral-curing silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in aluminum-framed systems indicated.
  - 1. Provide sealants for use inside of the weatherproofing system that have a VOC content of 100 > g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.

## PART 3 – EXECUTION

### 3.1 STANDARDS AND PERFORMANCE

- A. Watertight and airtight installation of each piece of glass required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors) without failure, including loss or breakage of glass, failure of sealants or gaskets to remain watertight and air tight, deterioration of glazing materials, and other defects in the Work.
- B. Protect glass from edge damage at all times during handling, installation, and operation of the building.
- C. Glazing channel dimensions as shown are intended to provide for necessary minimum bite on the glass, minimum edge clearance, and adequate sealant thicknesses with reasonable tolerances. The glazier is responsible for correct glass size for each opening within the tolerances and necessary dimensions established.
- D. Comply with combined recommendations of glass manufacturer and manufacturer of sealants and other materials used in glazing and their technical representatives except where more stringent requirements are shown or specified.
- E. Comply with "Glazing Manual" by Flat Glass Marketing Association and the manufacturers of the glass and glazing materials except as shown and specified otherwise.
- F. Inspect each piece of glass immediately before installation and eliminate those which have observable edge damage or face imperfections.
- G. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw, and blow oriented in the same direction as other pieces.

### 3.2 EXAMINATION

- A. Examine glass framing, with glazier present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
  - 2. Presence and functioning of weep system.
  - 3. Minimum required face or edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

### 3.3 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

### 3.4 GLAZING, GENERAL

- A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass from edge damage during handling and installation as follows:
  - 1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.
  - 2. Remove damaged glass from Project site and legally dispose of offsite. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- D. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
  - 1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
  - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.



- G. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- J. Square cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### 3.5 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Secure compression gaskets in place with joints located at corners to compress gaskets producing a weather tight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- C. Install gaskets so they protrude past face of glazing stops.

### 3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel weep systems until sealants cure. Secure spacers in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

### 3.7 LOCK-STRIP GASKET GLAZING

- A. Comply with ASTM C 716 and gasket manufacturer's printed recommendations. Provide supplementary wet seal and weep system unless otherwise indicated.

### 3.8 MIRROR INSTALLATION

- A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
- B. Provide a minimum airspace of 1/8 inch between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.

- C. Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.
  - 1. Aluminum J-Channels and Cleat: Fasten J-channel directly to wall and attach top trim to continuous cleat fastened directly to wall.
  - 2. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.

### 3.9 PROTECTION AND CLEANING

- A. Protect glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.
- E. Wash glass on both faces in each area of Project not more than four (4) days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION 08 80 00

## SECTION 08 80 20 – SPANDREL INSULATED PANELS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Spandrel insulated panels.

#### 1.3 REFERENCES

- A. ANSI Z97.1 – Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- B. ASTM C-162 – Standard Terminology of Glass and Glass Products.
- C. ASTM C864 – Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- D. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.
- E. ASTM C1036 – Standard Specification for Flat Glass.
- F. ASTM C1048 – Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
- G. ASTM C1349 – Standard Specification for Architectural Flat Glass Clad Polycarbonate.
- H. ASTM D1781-76 – Climbing Drum Peel Test for Adhesives.
- I. ASTM D3363-74 – Method for Film Hardness by Pencil Test.
- J. ASTM D2794-90 – Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- K. ASTM D3359-90 – Method for Measuring Adhesion by the Tape Test.
- L. ASTM E330-84 – Structural Performance of Exterior Windows, Curtain Walls and Doors under the Influence of Wind Loads.
- M. AAMA 2604 – Voluntary Specification, Performance Requirements and Test Procedure for Superior Performing Organic Coating on Aluminum Extrusions and Panels.
- N. CPSC 16 CFR 1201 – Safety Standards for Architectural Glazing Materials.
- O. GANA – Glazing Manual.
- P. GANA Laminated Glazing Reference Manual.
- Q. FGMA – Sealant Manual.
- R. SIGMA – TM-3000 “Vertical Glazing Guidelines” and TB-3001 “Sloped Glazing Guidelines.”
- S. SGCC – Safety Glazing Certification Council.
- T. FBC – Florida Building Code.

1.4 DEFINITIONS

- A. Manufacturers: Firms that produce insulated panes as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

1.5 ACTION SUBMITTALS

- A. Product Data: For each product and glazing material indicated.
- B. Samples: For each type of panel; 12 inches square.
- C. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- D. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.
- E. Approvals: Manufacturer shall submit documentation that product complies with and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For glass and panel products, from manufacturer.
- B. Warranties: Sample of special warranties.

1.7 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- C. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- D. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

1.8 PRE-INSTALLATION MEETING

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
- B. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- C. Review temporary protection requirements for glazing during and after installation.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect panels according to manufacturer's written instructions. Prevent damage to panels from condensation, temperature changes, direct exposure to sun, or other causes.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with installation when ambient and substrate temperature conditions are outside limits permitted by panel manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install panels when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F (4.4 deg C).

1.11 WARRANTY

- A. Manufacturer's Products: Manufacturer's standard form in which panel manufacturer agrees to replace units that deteriorate or delamination within specified warranty period.
  - 1. Warranty Period: Five (5) years from date of Substantial Completion.

1.12 PERFORMANCE

- A. Safety Glass: Tested and labeled to CPSC 16 CFR 1201. Safety film not acceptable as alternative to tempered or laminated glass.
- B. Approvals: Manufacturer shall certify that product complies with and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. MapeSpan Industries, Inc.

2.2 MATERIALS

- A. Basis of Design: "Mapespan Ceramic-backed Spandrel Glass Panels"
- B. Composition: Composite panel composed of tempered glass with ceramic frit on #2 surface combined with an insulative core, inner substrate and an aluminum inner panel.
- C. Exterior Glass: 1/4" tempered glass complying with ASTM C1048, ANSI Z97.1, and CPSC 16 CFR 1201, Category II.
  - 1. Process in horizontal position so that inherent roller distortion will run parallel to building floor lines after installation.
  - 2. Color: As selected by the Architect
- D. Insulation: Isocyanurate (modified urethane)
- E. Inner Substrate: 1/2" gypsum board
- F. Inner Panel face: Aluminum with paint finish.
- G. Total panel thickness: 1" at storefront system and 1-3/4" at hollow metal system.

2.3 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
  - 1. Neoprene complying with ASTM C 864.
  - 2. EPDM complying with ASTM C 864.
  - 3. Silicone complying with ASTM C 1115.

4. Thermoplastic polyolefin rubber complying with ASTM C 1115.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene EPDM silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.
  1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.
- C. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock-strips, complying with ASTM C 542, black.

## 2.4 GLAZING SEALANTS

- A. General:
  1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  3. Sealants used inside the weatherproofing system, shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  4. Sealants used inside the weatherproofing system 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."
  5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
- C. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.

## 2.5 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## 2.6 FABRICATION OF PANELS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of panels to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

## 2.7 FINISHES

- A. Aluminum Surfaces: Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- D. Aluminum High-Performance Organic Finish Two-Coat Fluoropolymer: Chemical Finish Organic Coating, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight. Complying with paint manufacturer's written instructions for cleaning, preparing, pretreating and apply coating to exposed metal surfaces to comply with AAMA 2604.
  - 1. Color and Gloss: As selected by Architect from full range of industry colors and color densities.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:



1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  2. Presence and functioning of weep systems.
  3. Minimum required face and edge clearances.
  4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate interior surfaces. Do not use materials that will leave visible marks in the completed work.

### 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for panels where length plus width is larger than 50 inches.
1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

### 3.4 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### 3.5 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### 3.6 CLEANING AND PROTECTION

- A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.

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Library Renovation & Addition  
Phase: Construction Documents  
Bid Number: BID-SJR-03-2019

- C. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- D. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 08 80 10



## SECTION 08 91 19 – FIXED LOUVERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Fixed louvers and frames.
  - b. Screening.
  - c. Soffit louver.

#### 1.3 REFERENCES

- A. AMCA 500-L (Air Movement Council Association) – Laboratory Methods of Testing Louvers for Rating.
- B. ASTM A167 – Stainless and Heat-Resisting Chromium-Nickel Steel Plate.
- C. ASTM A653/A653M – Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process or Zinc-Iron Alloy Coated Galvannealed).
- D. ASTM B209 – Aluminum Alloy Sheet and Plate.
- E. ASTM B221 – Aluminum Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
- F. AAMA 2605 – Voluntary Specification, Performance Requirements and Test Procedure for Superior Performing Organic Coating on Aluminum Extrusions and Panels.
- G. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Provide data describing design characteristics, maximum recommended air velocity, free area, materials and finishes.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
  - 1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
  - 2. Show mullion profiles and locations.
- C. Samples: For each type of metal finish required.

- D. Approvals: Manufacturer submit documentation that product complies with large and small missile impact criteria and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.
- E. Environmental:
  - 1. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
    - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
    - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
    - c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
    - d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
  - 2. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500-mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
    - a. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
    - b. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
    - c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
    - d. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

## 1.5 INFORMATION SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

## 1.6 QUALITY ASSURANCE

- A. Perform work in accordance with AMCA Certification for louvers.
- B. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- C. Each type of product specified shall bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

#### 1.7 PREINSTALLATION MEETINGS

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
- B. Review fixed louver details and condition of other construction that affect installation.
- C. Review sheet metal pan flashing and sleeve installation.

#### 1.8 MOCK-UP

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
- B. Build mockup of typical fixed louver, pan flashing, screen, sleeve and other applicable sheet metal items and accessories.
- C. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- D. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.9 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.
- B. Coordinate work with installation of wall assembly.
- C. Coordinate work with installation of mechanical ductwork.

#### 1.10 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.
- B. Warranty: Include coverage for degradation of finish.

#### 1.11 PERFORMANCE REQUIREMENTS

- A. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 550.

- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change (Range): 80 deg F, ambient; 120 deg F, material surfaces.
- C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.
- D. Approvals: Manufacturer shall certify that product complies with large and small missile impact criteria and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Ruskin Company
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Airolite Company
  - 2. Greenheck Fan Company

### 2.2 LOUVERS

- A. Wall Louvers:
  - 1. Basis of Design: "EME 420MD"
    - a. Florida Product Approval: FL#21829.4
  - 2. Provide fasteners for louver installation into wall material per the product approval.
  - 3. Provide brake metal sill flashing with finish to match louver, turn inside edge up 1/2 inch to for lip at back of louver and location 1/2 inch away from louver.
  - 4. Provide brake metal trim at jambs and head to accommodate conditions and finish all edges of opening for louver.

### 2.3 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
  - 1. Screen Location for Fixed Louvers: Interior face.
  - 2. Screening Type: Bird and insect screening.
- B. Secure screen frames to louver frames with machine screws with heads finished to match louver, spaced a maximum of 6 inches from each corner and at 12 inches o.c.



C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Metal: Same type and form of metal as indicated for louver to which screens are attached. Reinforce screen frames at corners with clips.
2. Finish: Mill finish unless otherwise indicated.
3. Type: Rewirable frames with a driven spline or insert.

2.4 BLANK-OFF PANELS

A. Uninsulated, Blank-Off Panels: Metal sheet attached to back of louver if indicated.

1. Blank-off sheet for aluminum louvers, not less than 0.050-inch nominal thickness minimum.
2. Panel Finish: Same finish type applied to louvers, but black color.
3. Attach blank-off panels with sheet metal screws.

2.5 ACCESSORIES

A. Fasteners: Use types and sizes to suit unit installation conditions from 300 series stainless steel.

1. For color-finished louvers, use fasteners with heads that match color of louvers.

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

C. Flashings: Of same material as louver frame.

D. Sealants: Type specified in specification section – “Joint Sealants.”

2.6 MATERIALS

A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6

B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Steel sheet shall be ASTM A653/A653M, galvanized to G90 zinc coating, pre-finished with shop applied fluropolymer finish.

2.7 FABRICATION

A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Maintain equal louver blade spacing to produce uniform appearance.

C. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

- D. Include supports, anchorages, and accessories required for complete assembly.
- E. Provide intermediate mullions of type and at spacings indicated, but not more than is recommended by manufacturer. Provide a concealed piece of formed steel, or formed and extruded aluminum profiled to suit louver frame.
- F. Head and Sill Flashings: Roll formed or extruded to required shape, single length in one piece per location.
- G. Exterior Corners: Prefabricated corner units with mitered and welded corners.
- H. Provide sub-sills made of same material as louvers. Roll formed or extruded to required shape, single length in one piece per location.
- I. Join frame members to each other and to fixed louver blades with fillet welds concealed from view unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.
- J. Screens: Install a screen mesh in a shaped frame, with reinforce corner construction, and shop installed to louver with fasteners.
- K. Design and fabricate louver to prevent entry of wind driven rain into the building. Provide louver, which traps rain and diverts water back to the exterior and not into the building or the wall cavity.
- L. Sleeve:
  - 1. Fabricate an aluminum 12-gauge sleeve around entire perimeter of louvered opening, 16" in horizontal depth, with a 1-1/2" perimeter flange at the exterior perimeter, with an upturned flange along the back of the sleeve, so there is at least 2" between the bottom of the ductwork and the bottom of the sleeve.
  - 2. The sleeve is to serve as a pan to collect wind driven rainwater back to the exterior of the building envelope.
  - 3. Seal all louvers to wall penetrations through the sleeve.
  - 4. Also seal both the exterior and interior perimeter of the sleeve.
  - 5. Connect and seal to ductwork as required.

## 2.8 FINISHES

- A. Aluminum Surfaces: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- B. Aluminum Surfaces: Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

- E. High-Performance Organic Finish Three-Coat Fluoropolymer: Chemical Finish Organic Coating, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight. Complying with paint manufacturer's written instructions for cleaning, preparing, pretreating and apply coating to exposed metal surfaces to comply with AAMA 2605.
  - 1. Color and Gloss: As selected by Architect from full range of industry colors and color densities.
- F. Shop coat the exterior steel surfaces, screens, and blank-out sheeting with a coat of primer for field painting.
- G. Final finishes of exterior aluminum surfaces, screens, and blank-out sheeting as selected by Architect.
- H. The interior steel surfaces, screens, and blank-out sheeting shall be of galvanized or galvannealed, unfinished material.
- I. Interior aluminum surfaces, screens, and blank-out sheeting shall be of mill finished.

## 2.9 ENVIRONMENTAL

- A. Recycled Content: Minimum total recycled content equal to 25 percent with 23 percent post-consumer recycled content or minimum 20 percent pre-consumer recycled content at Contractor's option.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Verify that prepared openings, flashings and ductwork are ready to receive work and opening dimensions are as indicated on shop drawings.

### 3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

### 3.3 INSTALLATION

- A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible.

- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Protect unpainted galvanized and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.
- G. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- H. Secure louvers in opening framing with concealed fasteners, removable and hinged for maintenance purposes.
- I. Install insect screens and frame to intake louvers.
- J. Install bird screens to exhaust louvers.
- K. Install perimeter sealant and backing rod in accordance with Section – Joint Sealants.

#### 3.4 ADJUSTING AND CLEANING

- A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

END OF SECTION 08 91 19

## SECTION 09 22 16 – NON-STRUCTURAL METAL FRAMING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Steel framing systems.
    - b. Suspension systems for ceilings, soffits, and grid systems.

#### 1.3 REFERENCES

- A. ASTM A641 – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
- B. ASTM A780/A789M – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- C. ASTM A1003/A1003M-15 – Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
- D. ASTM C645 – Standard Specification for Nonstructural Steel Framing Members.
- E. ASTM C653/C653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- F. ASTM C754 – Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- G. ASTM C840 – Standard Specification for Application and Finishing of Gypsum Board.
- H. ASTM C1513 – Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
- I. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- J. ASTM E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- K. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials.
- L. ASTM E413-10 – Classification for Rating Sound Insulation.
- M. MFMA (Metal Framing Manufacturer's Association) – Guidelines for the Use of Metal Framing.
- N. ASCE 7 – Minimum Design Loads for Buildings and other Structures.
- O. Underwriters Laboratories (UL) – Fire Resistance Manual.
- P. Gypsum Association (GA) – Fire Resistance Design Manual.
- Q. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Provide data describing standard framing member materials and finish, product criteria, load charts and limitations.
  - 1. Describe methods and provide details for securing studs to tracks, deflection tracks, splicing, and for blocking and reinforcing for studs which were cut or modified for piping and conduit penetrations.
- B. Studs and Runners: Provide documentation that framing members' certification is according to SIFA's "Code Compliance Certification Program for Cold-Formed Steel Structural and Non-Structural Framing Members."
- C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- D. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- E. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATION SUBMITTALS

- A. Evaluation Reports: For embossed steel studs and runners and firestop tracks, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
- B. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.6 QUALITY ASSURANCE

- A. Product manufacturers shall be current members of Steel Stud Manufacturers Association (SSMA).
- B. Provide full time quality control over fabrication and erection complying with applicable codes and regulations of government agencies having jurisdiction.
- C. Submit manufacturer's storage and product installation instructions.
- D. Submit documentation verifying materials and components are from single manufacturer.
- E. Installer shall submit qualifications demonstrating five consecutive years of installing specified products of similar and equivalent work scope.

1.7 PREINSTALLATION MEETINGS

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Notify manufacturer of damaged materials received prior to installing.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store materials inside building, protected from exposure to water, wind or other harmful weather conditions.

1.9 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

1.10 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.
- B. 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.
- C. Design steel in accord with American Iron and Steel Institute Publication "Specification for the Design of Cold-Formed Steel Structural Members", except as otherwise shown or specified.

- D. Design loads: 5 PSF minimum design lateral load is required for interior walls by building code.
- E. Framing systems for interior non-load bearing walls shall withstand design loads for lateral deflections less than L/240.
- F. Framing system to accommodate deflection of primary building structure and construction tolerances.
- G. Framing shall conform to load charts and limitations and shall be designed to accommodate special loading conditions such as point loads, eccentric loads, etc.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer shall be one of the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. ClarkDietrich Building Systems
  - 2. Marino/Ware, Inc.
  - 3. MBA Building Supplies
  - 4. Steel Network, Inc.

### 2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
  - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal and as otherwise indicated.
  - 2. Protective Coating: ASTM A 653/A 653M.
- B. Studs and Runners: Use either steel studs and runners or dimpled steel studs and runners.
  - 1. Steel Studs and Runners:
    - a. Minimum Base-Metal Thickness: 20-gauge or manufacturer's equivalent and as indicated otherwise.
    - b. Depth: 3-5/8", 6" and as indicated otherwise.
    - c. Punch Outs: 12" from base and every 48" thereafter.
    - d. Stud Angle Bracing: 2-1/2"
- C. Slip-Type Head Joints:
  - 1. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
  - 2. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. "MaxTrak Slotted Deflection Track" as manufactured by ClarkeDietrich Building Systems.
    - b. "Flat Steel Deflection Track" as manufactured by MBA Building Supplies.



c. "VertiClip SLD Series" as manufactured by Steel Network, Inc.

D. Firestop Tracks:

1. Top runner to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
2. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
  - a. "Fire Trak System attached to studs with Fire Trak Posi Klip" as manufactured by Fire Trak Corp.
  - b. "The System" as manufactured by Metal-Lite, Inc.
  - c. "Blaze Frame Firestop Track" as manufactured by ClarkeDietrich Building Systems.

E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: 16-gauge by 4" wide and as indicated on drawings.

F. Cold-Rolled Channel Bridging:

1. Minimum Base-Metal Thickness: 16-gauge and as indicated on drawings.
2. Depth: 1-1/2" x 1/2".
3. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch thick, galvanized steel.

G. Hat-Shaped, Rigid Furring Channels:

1. Minimum Base-Metal Thickness: 25-gauge and as indicated on drawings.
2. Depth: As indicated on drawings and if not indicated 2-9/16" wide x 7/8" high.

H. Stud Furring:

1. Minimum Base Metal Thickness: Same thickness as steel studs and runners.
2. Depth: 1-5/8", 3-5/8", 6" and as indicated on drawings.

I. Z-Shaped Furring: Non-slotted web with 3/4" wall attachment flange.

1. Minimum Base Metal Thickness: 25-gauge or manufacturer's equivalent and as indicated on drawings.
2. Depth: 1, 1-1/2" and as indicated on drawings.

## 2.3 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch diameter wire, or double strand of 0.048-inch diameter wire.
- B. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- C. Carrying Channels: Cold-rolled, 1 1/2" deep commercial-steel sheet with a base-metal thickness of 16-gauge with 1/2-inch wide flanges.
- D. Cold-Rolled Channels: 16-gauge uncoated-steel thickness, with minimum 1/2-inch wide flanges, 3/4 inch deep.

- E. Hat-Shaped, Rigid Furring Channels: 7/8 inch deep minimum base-metal thickness of 25-gauge and as indicated on drawings.
- F. Suspension Systems for Exterior Soffits and Ceilings: Direct-hung grid suspension system composed of the main beams and cross tee members that interlock to form a modular supporting system, provide uplift restraints to comply with wind load design requirements.
  - 1. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. Armstrong World Industries: Stucco/Plaster Grid System
- G. Suspension Systems for Interior Gypsum Board Ceilings: Direct-hung grid suspension system composed of the main beams and cross furring members that interlock to form a modular supporting system.
  - 1. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. Armstrong World Industries: Drywall Grid System
    - b. Chicago Metallic Corporation: Drywall Grid System
    - c. USG Corporation: Drywall Grid System
- H. Hanger Attachments to Concrete:
  - 1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488/E 488M conducted by a qualified testing agency.
  - 2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

## 2.4 STUD SUPPORTED CEILING/SOFFITS

- A. Studs and Runners:
  - 1. Minimum base metal thickness: Same thickness as steel studs and runners.
  - 2. Depth: 3-5/8", 6" and as indicated on drawings or larger as required to support ceiling/soffit design load.

## 2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
  - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
  - 2. Fasteners: Self-drilling, self-tapping screws; complying with ASTM C1513-13 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
- B. Framing Accessories: Accessories required in this project.
  - 1. Flat Strapping for Backing Strip.

2. Flat Strapping and bridging for lateral bracing.
3. Connection Angles.

C. Isolation Strip at Exterior Walls: 15# asphaltic impregnated felt.

## 2.6 FINISHES

A. Framing Materials:

1. Galvanizing shall conform to with ASTM A 653
2. Galvanized to G40 for interior materials.
3. Galvanized to G60 for exterior materials.
4. Galvanized to G60 for interior materials in contact with cementitious materials or other materials that could induce corrosive actions.

B. Hangers, Anchors and Fastening Devices: Galvanized

1. Galvanized to G40 for interior materials.
2. Galvanized to G60 for exterior materials.
3. Galvanized to G60 for interior materials in contact with cementitious materials or other materials that could induce corrosive actions.

C. Touchup Paint

1. Comply with ASTM A780/A780M-09 (2015): Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

## 2.7 ENVIRONMENTAL

A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

### 3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
  1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, wall cabinets or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.
- F. Floor track shall be bedded in two (2) beads of continuous acoustical sealant at all sound rated partitions.

### 3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
  1. Single-Layer Application: 16 inches o.c. unless otherwise indicated.
  2. Tile Backing Panels: 16 inches o.c. unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
- E. Install deep leg head track wherever wall extends to underside of roof or floor structure and provide space for structural deflection. Install one row of horizontal bridging parallel to and within 8 inches of head track. Do not attach studs to head track.
- F. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
- G. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

1. Install two studs at each jamb unless otherwise indicated.
  2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
  3. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
- H. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- I. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
- J. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
- K. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- L. Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 16 inches o.c.
1. Furring: 16 inches o.c.
- M. Z-Furring Members:
1. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 16 inches o.c.
  2. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
- N. Stud Supported Ceiling
1. Studs: 16 inches o.c. or as required to meet design loads.
- O. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.
- 3.5 INSTALLING SUSPENSION SYSTEMS
- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
1. Hangers: 48 inches o.c.
  2. Carrying Channels (Main Runners): 48 inches o.c.
  3. Furring Channels (Furring Members): 16 inches o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
  - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
  - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
4. Do not attach hangers to steel roof deck.
5. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
6. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
7. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

### 3.6 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 09 22 16

## SECTION 09 24 00 – CEMENT PLASTERING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Exterior portland cement plasterwork.

#### 1.3 REFERENCES

- A. ASTM C91 – Standard Specification for Masonry Cement.
- B. ASTM C150 – Standard Specification for Portland Cement.
- C. ASTM C206 – Standard Specification for Finishing Hydrated Lime.
- D. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes.
- E. ASTM C473 – Standard Test Methods for Physical Testing of Gypsum Panel Products.
- F. ASTM C847 – Standard Specification for Metal Lath.
- G. ASTM C897 – Standard Specification for Aggregate for Job Mixed Portland Cement-Based Plasters.
- H. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.
- I. ASTM C926 – Standard Specification for Application of Portland Cement Based Plaster.
- J. ASTM C1002 Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- K. ASTM C1177 – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- L. ASTM E72 – Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
- M. ASTM E96 – Standard Test Methods for Water Vapor Transmission of Materials.
- N. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials.
- O. PCA (Portland Cement Association) – Plaster (Stucco) Manual.
- P. GA-600 – Fire Resistance Design Manual.
- Q. ML/SFA (Metal Lath / Steel Framing Association)–Specifications for Metal Lathing and Furring.
- R. ASCE 7 – Minimum Design Loads for Buildings and other Structures.
- S. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated submit copies of manufacturer' product specifications and installation instructions and other data as may be required to show compliance with these specifications.

- B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For each type of finish coat indicated; 12 by 12 inches, and prepared on rigid backing.
- D. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 2. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 3. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 4. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 5. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- E. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 QUALITY ASSURANCE

- A. Cement Plaster: Perform work in accordance with ASTM C926.
- B. Allowable Tolerances: For flat surfaces, do not exceed 1/8" to 10'-0" for bow, warp, plumb, or level.
- C. Applicator shall show proof of specializing in lath and plaster work for a minimum of 5-years.

#### 1.6 MOCKUP

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
- B. Build mockups for each substrate and finish texture indicated for cement plastering, including accessories.



- C. Size: 100 sq. ft. in surface area.
- D. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- E. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.7 PRE-INSTALLATION MEETINGS

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- B. Installation of rusted furring members is not acceptable.

#### 1.9 FIELD CONDITIONS

- A. Exterior Plasterwork:
  - 1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
  - 2. Apply plaster when ambient temperature is greater than 40 deg F.
  - 3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

#### 1.10 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

#### 1.11 PERFORMANCE

- A. Fabricate vertical elements to limit finish surface to 1/240 deflection under lateral point load of 100 lbs.
- B. Fabricate horizontal elements to limit finish surface to 1/240 deflection under superimposed dead loads and wind uplift loads.

- C. Conform to ASTM E119 and applicable code for fire rated assemblies as follows:
  - 1. Fire Rated Partitions: Listed assembly by UL or FM.
  - 2. Fire Rated Ceiling and Soffits: Listed assembly by UL or FM.
  - 3. Fire Rated Structural Column Framing: Listed assembly by UL or FM.
  - 4. Fire Rated Structural Beam Framing: Listed assembly by UL or FM.
  
- D. Delegated-Design: Provide design services, calculations and shop drawings for delegated design requirements of soffits complying with code requirements, performance requirements and design criteria signed and sealed by an engineer registered in the State of Florida.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer shall be one of the following and as indicated however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. ClarkDietrich Building Systems
  - 2. Nile Building Products Co.
  - 3. MarinoWare
  - 4. Amico, A Gibraltar Industries Co.
  - 5. Alabama Metal Industries
  - 6. Steel Network, Inc.
  - 7. MBA Building Supplies

### 2.2 FURRING MATERIALS

- A. Channels shall be fabricated from galvanized 16-gauge cold rolled steel, free of rust of the following minimum weight per thousand lineal feet.
  - 1. 3/4 inch furring channels: 16-gauge, 300 pound minimum L.F.
  - 2. 1-1/2 inch carrying channels: 16-gauge, 500 pound minimum L.F.
  
- B. Tie and hanger wire to be of galvanized, soft annealed steel or of a material and size having superior corrosion resistance and equivalent strength to the wire specified.
  - 1. Tie wire: 16-gauge
  - 2. Hanger wire: 8-gauge
  
- C. Hangers: Steel, of size and type to suit application, rigidly support-ceiling components in place, and meet deflection limits as indicated.
  
- D. Lateral Bracing: Formed steel; minimum 16-gauge thick; size and length as required.

### 2.3 GLASS-MAT GYPSUM SHEATHING

- A. Fiberglass-Mat Faced Gypsum Sheathing: Comply with ASTM C1117/117M, Type X.
  - 1. Thickness: 5/8 inch.
  - 2. Width: 4 feet.
  - 3. Length: 8 feet.
  - 4. Edges: Square.
  - 5. Surfacing: Fiberglass mat on face, back and long edges
  - 6. Basis of Design: "DensGlas Sheathing" as manufactured by Georgia Pacific Gypsum, LLC
  - 7. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. National Gypsum Company
    - b. CertainTeed Corporation

### 2.4 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
- B. Lime: ASTM C 207, Type S.
- C. Perlite Aggregate: ASTM C 35.
- D. Aggregate: Natural or manufactured sand, complying with ASTM C926.
- E. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, and proprietary ingredients, with integral color pigment.
  - 1. Color as selected by the Architect.

### 2.5 TRIM ACCESSORIES

- A. General: Comply with ASTM C 1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Plastic Accessories
  - 1. Provide high impact polyvinylchloride (PVC) conforming to ASTM D1784, Type II, D4216.
  - 2. Thickness: 0.050-inch minimum.
  - 3. Color: Off-white.
  - 4. Size: 10 foot lengths.
  - 5. Cornerbeads: With perforated flanges.
    - a. Smallnose cornerbead; use unless otherwise indicated.
  - 6. Casing Beads: With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated.
    - a. Square-edge style; use unless otherwise indicated.
  - 7. Control Joints Type "V": One-piece-type, folded pair of unperforated screeds in V-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
  - 8. Expansion Joints: Two-piece type, formed to produce slip-joint and square-edged 1/2-inch wide reveal; with perforated concealed flanges.

9. Connectors
  - a. Connector clips: Polyvinylchloride (PVC) plastic clips for aligning continuous lengths of molding.
  - b. Notch-Lok Connections: Polyvinylchloride back plates for aligning intersecting lengths of moldings
  - c. "+" and "T" Intersections: Factory fabricated intersections used to connect horizontal and vertical joints of moldings.
10. Soffit Vent: 4" wide continuous by depth to match soffit material depth with double leg channels mounting channels verify with the Architect.
11. Reveals
  - a. 1/2" reveal by 1/2" ground.
  - b. 4" reveal by 1/2" ground.
12. Manufacturers are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
  - a. Plastic Components, Inc.
  - b. Vinyl Corp.
  - c. Amico, A Gibraltar Industries Co.

## 2.6 MISCELLANEOUS MATERIALS

- A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in portland cement plaster.
- C. Bonding Agent: Conform to ASTM C1059.
  1. Exterior applications and areas exposed to water immersion or to high humidity: A non re-emulsifiable acrylic emulsion. To be used as integrally mixed product when recommended by the Portland Stucco System Manufacturer.
  2. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. ThoroseallAcryl 60, as manufactured by Harris Specialty Chemicals, Inc.
    - b. Bonsal Acrylic Additive by W.R. Bonsal Company.
    - c. Silkalatex, as manufactured by Sika Chemical Corporation.
- D. Waterproofing: Formulated stearate compound for increasing the water repellency.
  1. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. "Hydrocel" as manufactured by Lambert Corporation
    - b. "Omicron Mortar proofing" as manufactured by Master Builders
    - c. "Hydratite" as manufactured by A. C. Horn
- E. Admixture: Acrylic-polymer emulsion "Acrylic 60" as manufactured by Thoroseral.
- F. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.

- G. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter unless otherwise indicated.

## 2.7 LATHING MATERIALS

- A. General: Lath shall be manufactured to meet ASTM C847 with ASTM A653/A653M, G60 hot-dip galvanized zinc coating.
- B. Diamond-Mesh Lath: Self-furring diamond mesh with dimples or raised ribs, G-60 zinc galvanized and weighing not less than 3.4 pounds per sq. yd.
- C. Paper Backed Metal Lath: Self-furring diamond mesh with dimples or raised ribs, G-60 zinc galvanized and weighing not less than 3.4 pounds per sq. yd. and with asphalt-impregnated paper backing. Grade B, Style 1a, vapor-retardant paper.
- D. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.
- E. Glass Fiber Mesh: Shall be Type 207A, Perma Tite glass mesh 10 by 10 construction, white resin coated, conforming to ASTM D1668, Type III, self-adhering. Acceptable manufacturer: Perma Glass Mesh Corporation, Dover, Ohio.
- F. Corner Mesh: Formed sheet steel; minimum 26-gauge thick; expanded flanges shaped to permit complete embedding in plaster; minimum 4" size.
- G. Strip Mesh: Expanded metal lath, minimum 26-gauge thick 4" wide x 24" long.
- H. Vertical Metal Waterproof Lath: Paper faced welded wire sheets, stucco rite standard as manufactured by K-lath.

## 2.8 PLASTER MIXES

- A. General: Comply with ASTM C 926 for applications indicated.
- B. Basis of Design: "Master Builders (BASF)".
- C. The following manufacturer's subject to compliance with requirements are accepted and equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
  - 1. Quickrete Company
  - 2. Titan Florida LCC
- D. Exterior Cement Plaster for Use over Metal Lath:
  - 1. Scratch Coat: Pre-blended mixture of portland cement, reinforcing fibers and manufacturers additional ingredients "Stucco Base".
  - 2. Brown Coat: Pre-blended mixture of portland cement, reinforcing fibers and manufacturers additional ingredients "Stucco Base".
  - 3. Finish Coat: Waterproofing cement-based coating "MasterSeal - Waterproof Cement Based Coating #584".

4. Admixture: Water based acrylic bonding and modifying admixture which shall be added to all coats "Acryl 60".
5. Total vertical system thickness: 7/8"
6. Total horizontal system thickness: 3/4"

E. Exterior Cement Plaster for Use over Masonry and Concrete:

1. First Coat: Waterproofing cement-based coating "MasterSeal - Waterproof Cement Based Coating #584".
2. Finish Coat: Pre-blended mixture of portland cement, reinforcing fibers and manufacturers additional ingredients "Stucco Base."
3. Admixture: Water based acrylic bonding and modifying admixture which shall be added to all coats "Acryl 60".
4. Total system thickness: 5/8"

F. Fenestration Openings Flashing

1. Flashing: Waterproofing cement-based coating "MasterSeal - Waterproof Cement Based Coating #581".

## 2.9 FINISHES

A. Framing Materials:

1. Galvanized to G40 for interior materials.
2. Galvanized to G60 for exterior materials.
3. Galvanized to G60 for materials in contact with other materials.

B. Hangers, Anchors and Fastening Devices: Galvanized

1. Galvanized to G40 for interior materials.
2. Galvanized to G60 for exterior materials.
3. Galvanized to G60 for materials in contact with other materials.

C. Stucco: Sand

## 2.10 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Before plaster is applied, the surfaces to be plastered shall be carefully examined by the subcontractor. The Architect and General Contractor shall be notified of unsatisfactory surfaces or conditions. Application of stucco shall not proceed until unsatisfactory conditions have been corrected.
  - 1. Concrete: Verify joints are cut flush and surface is ready to receive Work. Verify no bituminous, water repellent coatings, or form release agents are on concrete surfaces to receive stucco finish.
  - 2. Concealed Supports, Blocking: Verify items have been installed in proper locations.
  - 3. Mechanical and Electrical: Verify services within walls and soffits have been installed, tested and approved.
- D. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, and structural framing with Installer present for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare solid substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.
- C. Protect surfaces near stucco application from damage or disfiguration. Clean concrete surfaces of foreign matter. Thoroughly dampen surfaces before using acid solutions, solvent, or detergents to perform cleaning. Wash surfaces with clean water. Do not apply stucco until electrician has protected all boxes. Cover openings in wall, column and soffit with wire lath prior to stuccoing. Secure covering for openings greater than 16 inches in their least dimension to properly anchored channels or other support. Conceal all piping, conduit, etc. which cannot be concealed in walls, columns or soffits with wire lath and stucco. Verify all surfaces to receive stucco are true and plumb. Chip back concrete as required and replace masonry where necessary to avoid thickness greater than indicated for finished systems. Patch all masonry joints and honeycombing in cast-in-place concrete to provide flush, true surfaces to receive stucco. Pressure clean all surfaces with pressurized water with machine providing a minimum of 3,500 p.s.i. with a turbo-nozzle capable of developing sufficient force to remove all foreign matter from masonry surfaces. Abrade all cast-in-place concrete surfaces to receive stucco to promote mechanical bond. On exterior masonry and concrete surfaces install temporary grounds and screeds as necessary to strike off stucco to true surfaces. No permanent corner beads, fabricated control joints, grounds or screeds shall be used on exterior masonry and poured concrete surfaces. On wire lath and interior applications, install corner beads, control joints, expansion joints and accessories indicated on drawings true and plumb using maximum lengths available. Anchor securely to substrate. Do not shim or bridge areas that are not plumb, true or straight.
- D. Exterior Surfaces
  - 1. Dampen exterior surfaces prior to the application of plaster and maintain in a moist condition throughout the course of application.

### 3.3 CEILING AND SOFFIT FRAMING

- A. Install furring to height indicated, erect after above ceiling or soffit work is complete.
  - 1. Coordinate the location of hangers with other work.
- B. Suspension System: Install 1-1/2 inch carrying channels at maximum spacing of 4 feet o.c. and 3/4 inch furring channels at maximum spacing of 16 inches o.c.
- C. Metal Lath: Install lath with lapped and broken joints and well secured to adjoining work. Lath to be folded around corners and angles 8 inches each way. Attach lath to furring at 6 inches o.c. for ceilings and bulkheads. Install self-furring metal lath to concrete and masonry surfaces with fastener type and spacing as recommended by lath manufacturer.
- D. Metal Studs: Install studs where indicated on the Drawings or where required for framing of bulkheads or ceilings.
- E. Install furring independent of walls, columns and above ceiling work.
- F. Provide uplift restraint studs at 4'-0" o.c. in each direct at exterior soffits.
- G. Securely anchor hangers to structural members or embed in structural slab.
  - 1. Space hangers to achieve deflection limits indicated.
- H. Securely fix carrying channels to hangers, prevent turning/twisting and transmit full load to hangers.
- I. Place furring channels perpendicular to carrying channels, not more than 2" from perimeter walls, and rigidly secure.
  - 1. Lap the splices securely.
- J. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing.
  - 1. Extend bracing minimum 24" past each opening.
- K. Laterally brace suspension system.
- L. Install plaster frames for recessed light fixtures furnished by electrical contractor under this section.

### 3.4 WALL GLASS-MAT GYPSUM SHEATHING INSTALLATION

- A. Lath board installation per manufacturer's installation instructions.

### 3.5 INSTALLING METAL LATH

- A. Metal Lath: Install according to ASTM C 1063.



2. Partition Framing and Vertical Furring: Install self-furring-diamond-mesh lath.
  3. Flat-Ceiling and Horizontal Framing: Install self-furring-diamond-mesh lath.
  4. Exterior Soffits and Areas Requiring Vapor Barriers: Install paper backed lath.
- B. Lathing Materials: Apply one (1) ply of felt underlayment over substrate, weatherlap edges four (4) inches minimum. Fasten in place. Apply metal lath taut, with long dimension perpendicular to supports. Lap ends minimum one (1) inch. Secure end laps with tie wire where they occur between supports. Lap sides of diamond mesh lath together minimum 1-1/2 inches. Nest outside ribs of rib lath together. Continuously reinforce interior angles with corner mesh except where metal lath returns three (3) inches from corner to form the angle reinforcement, fasten at perimeter edges only. Place strip mesh diagonally at corners of lathed openings. Secure rigidly in place. Where dissimilar materials abut, and surfaces are to receive a continuous application of stucco, provide a continuous 8" wide strip of galvanized wire lath, lapping 4" to either side of joint. EXCEPTION: where cast-in-place concrete has been poured on or against masonry, the joints do not require reinforcing.
- C. Self-Furring Metal Lath: Lap one inch and tie at 6-inch vertical spacing.
- D. Moisture Retention, Curing
1. Dampen previous stucco coats which have dried out prior to time for applications of next coat. Dampen with water as required for uniform suction. The Contractor is responsible for determining the most effective procedure for curing and time lapse between application of coats based on climatic and job conditions. Plaster which is cracked or crazed due to improper timing and curing will not be accepted. Remove and replace defective plaster, including plaster base materials if damaged during removal of defective plaster.
- E. Portland Cement Plaster Stucco Lathing and Furring Installation Standard: Install lathing, furring materials indicated for Portland cement plaster to comply with ANSI A42.3.
- F. Install supplementary framing, blocking, and bracing at terminations in work, for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, similar work to comply with details indicated, or if not otherwise indicated, to comply with applicable published recommendations of equipment manufacturers.
- G. Where lathing and metal support system abuts building structure horizontally, where partition/wall work abuts overhead structure, isolate the work from structural movement sufficiently to prevent transfer of loading onto work from building structure. Install slip or cushion type joints to absorb deflections, but maintain lateral support.
1. Frame both sides of expansion joints independently; do not bridge joints with furring, lathing, or accessories.
- H. Coordinate installation of ceiling suspension system with installation of overhead structural system to ensure that inserts, other structural anchorage provisions have been installed to receive ceiling hangers in a manner that will develop their full strength, at spacing required to support ceiling.
1. Furnish concrete inserts, other devices required, to other trades for installations well in advance of time needed for coordination with other work.

- I. Attach hangers to structure above ceiling to comply with ML/SFA "Specifications for Metal Lathing and Furring," with referenced standards, as per requirements of applicable building codes.
    - 1. Do not attach hangers to metal deck tabs.
  - J. Install ceiling suspension system components of sizes, spacing indicated, but not in smaller sizes or greater spacing than that required by referenced lathing, furring installation standards.
    - 1. Wire Hangers: Space 8-gauge (0.16 inch diameter) wire hangers not over 4 feet o.c. parallel with, and not over 3 feet perpendicular to, direction of carrying channels, unless otherwise indicated, within 6 inches of carrying channel ends.
    - 2. Stiff Legs at Exterior Suspension System: Space uplift restraints vertical carrying steel stud channels not over 4 feet o.c. along horizontal carrying channels. Firmly anchor vertical members to overhead structure.
  - K. Install components of steel stud/wall partition support systems to comply with directions of steel stud manufacturer for applications indicated and with the following:
    - 1. For non-load (axial) bearing stud system, comply with ASTM C754.
    - 2. For load-bearing (axial and transverse) stud systems, comply with ASTM C1007, and as indicated.
  - L. Steel Stud Systems to receive Metal Lath: Comply with requirements of ML/SFA "Specifications for Metal Lathing and Furring" applicable to each installation condition, type of metal stud system indicated.
  - M. Extend and attach partition support system to structure above suspended ceilings, unless otherwise indicated.
  - N. Metal Furring to Receive Metal Lath: Comply with requirements of ML/SFA "Specifications for Metal Lathing and Furring" applicable to each installation condition indicated.
  - O. Comply with referenced lathing and furring installation standards for provisions, location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joints, in alignment. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.
- 3.6 INSTALLING ACCESSORIES
- A. Install according to ASTM C 1063 and at locations indicated on Drawings.
  - B. Reinforcement for External Corners:
    - 1. Install lath-type, external-corner reinforcement at exterior locations.
    - 2. Install cornerbead at exterior locations.
  - C. Control and Expansion Joints: Install control and expansion joints at locations indicated on drawings.
    - 1. At distances between control joints of not greater than 18 feet o.c. or as indicated on the drawings and required by applicable standards.

2. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
3. Where control joints occur in surface of construction directly behind plaster.
4. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.
5. Expansion Joints: Install expansion beads at locations shown on the Drawings or as required. Maximum distance between expansion joints shall be 10 feet for cement plaster stucco work or 100 s.f.

D. Accessories:

1. Corner Beads: Install corner beads at horizontal and vertical corners.
2. Casing Beads: Install casing beads at locations where plaster meets other materials, and at terminations of stucco finishes. Butt and align ends.
3. Corner Opening Reinforcing: Install glass fiber mesh at 45 degrees at openings in the plane of the plaster surface such as doors and windows. Mesh strips shall be 4 inches wide and a minimum of 9 inches long, installed following manufacturer's recommendations.
4. At joints between concrete and wood, provide revel molding.
5. Install accessories to required lines and levels.

### 3.7 PLASTER APPLICATION

A. General: Comply with ASTM C 926.

1. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.
2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

B. Bonding Compound: Apply on masonry and concrete for plaster bases.

C. Plaster Finish Coats: Apply to provide finish to match Architect's sample.

### 3.8 INSTALLATION OF FENESTRATION OPENING FLASHING

A. Apply at jambs, head and sill of openings unless directed otherwise.

1. Do not apply at the bottom of openings where the bottom of the opening is the interior slab.

B. Apply full depth of opening and 2" onto the interior and exterior wall surface per manufacturer's installation directions.

1. Apply to fill voids and depressions to produce a uniform flat plane.

C. Install wood buck if required with a continuous bead of sealant between the buck and the flashing with one bead at the front and one at the back.

3.9 PLASTER REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.10 TOLERANCES

- A. Maximum Variation from True Position: 1/8" per 10'
- B. Maximum Variation of any Member from Plane: 1/8"

3.11 CLEANING

- A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

3.12 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 09 24 00

## SECTION 09 24 10 – CEMENT PLASTERING REPAIRING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Existing exterior portland cement plasterwork repair.

#### 1.3 REFERENCES

- A. ASTM C91 – Standard Specification for Masonry Cement.
- B. ASTM C150 – Standard Specification for Portland Cement.
- C. ASTM C206 – Standard Specification for Finishing Hydrated Lime.
- D. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes.
- E. ASTM C897 – Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters.
- F. ASTM C926 – Standard Specification for Application of Portland Cement-Based Plaster.
- G. ASTM D1623 – Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
- H. PCA (Portland Cement Association).

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For each type of finish coat indicated; 12 by 12 inches, and prepared on rigid backing.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.6 FIELD CONDITIONS

- A. Comply with ASTM C 926 requirements.
- B. Exterior Plasterwork:
  - 1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
  - 2. Apply plaster when ambient temperature is greater than 40 deg F.
  - 3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

1.7 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer shall be the following in each category however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
- B. Expanded Metal Lath
  - 1. Clarke Dietrich Building Systems.
  - 2. MarinoWARE.
  - 3. Amico, A Gibraltar Industries Co.
  - 4. Niles Building Products Co.
- C. Plaster
  - 1. Bonsal American, an Oldcastle Company; Marblesil Stucco Mix.
  - 2. QUIKCRETE; QUIKCRETE Finish Coat Stucco, No. 1201.
  - 3. SonoWall, BASF Wall Systems, Inc.; Thoro Stucco.

2.2 METAL LATH

- A. Expanded-Metal Lath: Self-furring diamond mesh, 3.4 lb./sq. yd. ASTM C 847 with ASTM A 653/A 653M, G60, hot-dip galvanized zinc coating.

### 2.3 LATH BOARD

- A. Lath Board: Fiberglass-mat faced gypsum sheathing complying with ASTM C1177:
  - 1. Basis of Design: Densglass Sheathing, Type X as manufactured by Georgia Pacific.
  - 2. Size: 5/8 inch thick by 48 inches wide.
  - 3. Weight: 1.9 lb./sq. ft.
  - 4. Edges: Square.
  - 5. Surfacing: Fiberglass mat on face, back, and long edges.

### 2.4 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
- B. Lime: ASTM C 207, Type S.
- C. Perlite Aggregate: ASTM C 35.
- D. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, and proprietary ingredients, with integral color pigment.
  - 1. Color as selected by the Architect.

### 2.5 TRIM ACCESSORIES

- A. General: Comply with ASTM C 1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required and to match existing type and configuration.

### 2.6 MISCELLANEOUS MATERIALS

- A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in portland cement plaster.
- C. Bonding Agent: Conform to ASTM C1059.
  - 1. Exterior applications and areas exposed to water immersion or to high humidity: A non re-emulsifiable acrylic emulsion. To be used as integrally mixed product when recommended by the Portland Stucco System Manufacturer.
  - 2. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. ThoroseallAcryl 60, as manufactured by Harris Specialty Chemicals, Inc.
    - b. Bonsal Acrylic Additive by W.R. Bonsal Company.
    - c. Silkalatex, as manufactured by Sika Chemical Corporation.
- D. Waterproofing: Formulated stearate compound for increasing the water repellency.
  - 1. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. "Hydrocel" as manufactured by Lambert Corporation
    - b. "Omicron Mortar proofing" as manufactured by Master Builders

- c. "Hydratite" as manufactured by A. C. Horn
  - E. Admixture: Acrylic-polymer emulsion "Acrylic 60" as manufactured by Thoroseral.
  - F. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.
  - G. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.
  - H. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter, unless otherwise indicated.
- 2.7 PLASTER MIXES
- A. General: Comply with ASTM C 926 for applications indicated.
  - B. Manufacturers: The basis of design products are manufactured by "Master Builders (BASF)".
  - C. The following manufacturer's subject to compliance with requirements are accepted and equal or better performing products of other manufacturers will be considered for acceptance by the architect.
    - 1. Quickrete Company
    - 2. Titan Florida LCC
  - D. Cement Plaster for Use over Metal Lath:
    - 1. Scratch Coat: Pre-blended mixture of portland cement, reinforcing fibers and manufacturers additional ingredients "Stucco Base".
    - 2. Brown Coat: Pre-blended mixture of portland cement, reinforcing fibers and manufacturers additional ingredients "Stucco Base".
    - 3. Finish Coat: Waterproofing cement-based coating "MasterSeal - Waterproof Cement Based Coating #584".
    - 4. Admixture: Water based acrylic bonding and modifying admixture which shall be added to all coats "Acryl 60".
    - 5. Total vertical system thickness: Match existing.
    - 6. Total horizontal system thickness: Match existing.
  - E. Cement Plaster for Use over Masonry and Concrete:
    - 1. First Coat: Waterproofing cement-based coating "MasterSeal - Waterproof Cement Based Coating #584".
    - 2. Finish Coat: Pre-blended mixture of portland cement, reinforcing fibers and manufacturers additional ingredients "Stucco Base".
    - 3. Admixture: Water based acrylic bonding and modifying admixture which shall be added to all coats "Acryl 60".
    - 4. Total system thickness: Match existing.
  - F. Fenestration Openings Flashing



1. Flashing: Waterproofing cement-based coating "MasterSeal - Waterproof Cement Based Coating #581".

## 2.8 TEXTURES

- A. Finish texture shall match existing when new stucco is placed adjacent to existing stucco.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Remove damaged and unbonded areas of stucco and damaged metal lath or lath board and suspension system. Provide replacement materials to match existing.

### 3.3 INSTALLING LATH BOARD

- A. Lath board installation per manufacturer's installation instructions.

### 3.4 INSTALLING METAL LATH

- A. Expanded-Metal Lath: Install according to ASTM C 1063.

### 3.5 INSTALLING ACCESSORIES

- A. Install according to ASTM C 1063 at locations commencing with the existing accessory layout.

### 3.6 PLASTER APPLICATION

- A. General: Comply with ASTM C 926
- B. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.

- C. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
- D. Provide plaster surfaces that are ready to receive field-applied finishes indicated.
- E. Bonding Compound: Apply on masonry and concrete for plaster bases.
- F. Walls; Base-Coat Mixes for Use over Masonry and Concrete: Scratch and brown coat for three-coat plasterwork.
- G. Ceilings and Soffits; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coat for three-coat plasterwork.
- H. Plaster Finish Coats: Apply to provide finish to match existing.

### 3.7 PLASTER REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

### 3.8 PROTECTION

- A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION 09 24 10

## SECTION 09 29 00 – GYPSUM BOARD

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Gypsum Board.
  - b. Gypsum Board Accessories.
  - c. Tile Backing Panels.
  - d. Texture Finishes.

#### 1.3 REFERENCES

- A. ASTM C36/C36M – Standard Specification for Gypsum Wallboard.
- B. ASTM C79/C79M – Standard Specification for Treated Core and Nontreated Core Gypsum Sheathing Board.
- C. ASTM C475 – Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- D. ASTM C630/C630M – Standard Specification for Water Resistant Gypsum Backing Board.
- E. ASTM C645 – Standard Specification for Nonstructural Steel Framing Members.
- F. ASTM C754 – Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products.
- G. ASTM C931/C931M – Standard Specification for Exterior Gypsum Soffit Board.
- H. ASTM C1325 – Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.
- I. ASTM E695 – Standard method for Measuring Relative Resistance of Wall, Floor, and Roof Construction to Impact Loading.
- J. ASTM D3273 – Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- K. ASTM D5420 – Standard Test Method for Impact Resistance of Flat Rigid Plastic Specimen by Means of a Striker Impacted by Falling Weight (Gardner Impact).
- L. ASTM E119 – Standard Test Methods for Fire Tests of Building Construction and Materials.
- M. ASTM C840 – Standard Specification for the Application and Finishing of Gypsum Board.
- N. GA 201 – Using Gypsum Board for Walls and Ceilings.
- O. GA-216 – Recommended Specifications for the Application and Finishing of Gypsum Board.
- P. GA-600 – Fire Resistance Design Manual.
- Q. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Submit copies of manufacturer's specifications and installation instructions for items required.
- B. Samples: For the following products:
  - 1. Trim Accessories: Full-size Sample in 12-inch- long length for each trim accessory indicated.
  - 2. Textured Finishes: Manufacturer's standard size, minimum 8" by 8" for each textured finish indicated and on same backing indicated for Work.
- C. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- D. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATION SUBMITTALS

- A. Include data substantiating that materials comply with specified requirements.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, 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, 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.
- D. 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.

#### 1.7 FIELD CONDITIONS

- A. Prior to and during installation, coordinate with work of other trades to facilities required openings and finishes.
- B. Conduct pre-construction meeting with drywall contractor, architect, owner, project coordinator, and others involved with process.

#### 1.8 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

#### 1.9 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. 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.
- C. Mold Resistant Assemblies: Provide materials and construction identical to those tested according to ASTM D 3273 and achieving a mold resistance score of 10.
- D. Perform gypsum board systems work in accordance with recommendations of ASTM C754, C840, and GA-216 except as otherwise specified in this section.
- E. Regulatory Requirements:
  1. Fire-rated Assemblies: Listed and rated by Underwriter's Laboratories, Inc. or generic fire resistance ratings listed in GA-600.
  2. Fire-Hazard Classification: Listed and labeled by Underwriter's Laboratories, Inc.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. USG Corporation and manufacturer as indicated.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. National Gypsum Company
  - 2. Georgia Pacific
  - 3. Certainteed Gypsum
  - 4. Continental Building Products

### 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 GYPSUM BOARD

- A. Gypsum Board: ASTM C 1396/C 1396M.
  - 1. Basis of Design: "Firecode Core Type X"
  - 2. Core: 5/8 inch (15.9 mm), Type X
  - 3. Long Edges: Tapered
- B. Moisture-Mold-Resistant and Abuse Resistant Gypsum Board: ASTM C 1629/C 1629M. With moisture- and mold-resistant core and paper surfaces.
  - 1. Basis of Design: "Mold Tough AR Firecode Type X"
  - 2. Core: 5/8 inch (15.9 mm), Type X
  - 3. Long Edges: Tapered
- C. High Impact-Resistant Gypsum Board: ASTM C 1629/C 1629M High impact resistant with heavy abrasion and mold/mildew/moisture resistant paper face.
  - 1. Basis of Design: "Mold Tough VHI Firecode Core Type X"
  - 2. Core: 5/8 inch, Type X
  - 3. Long Edges: Tapered
  - 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274
- D. Acoustical Gypsum Board: ASTM C 1396/C 1396M. Acoustically enhanced with inner face layer of viscoelastic dampening polymer and mold/mildew/moisture resistant paper face.
  - 1. Basis of Design; Soundbreak XP" as manufactured by National Gypsum Company.
  - 2. Core: 5/8" inch, Acoustically enhanced, Type X.
  - 3. Long Edges: Tapered.

4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274
- E. Exterior Gypsum Board: Comply with ASTM C 1117/C 117M, Type X
  1. Basis of Design: "DensGlass Sheathing"
  2. Core: 5/8", Type X
  3. Edges: Eased and tapered
- F. Flexible Gypsum Board: ASTM C 1396/C 1396M. Flexible to bend to fit radii.
  1. Core: 1/4" inch, Type X
  2. Long Edges: Tapered
  3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274

## 2.4 TILE BACKING PANELS

- A. Cement Backer Board: ASTM C1325
  1. Core: 5/8", Type X
  2. Edge: Manufacturers standard.
  3. Manufacturers and products are as indicated however equal or better performing.
    - a. Durock Cement Board; United States Gypsum Co.
    - b. DonCrete Cementitious Tile Backer Board; Domtar Gypsum

## 2.5 TRIM ACCESSORIES

- A. Plastic Trim: Provide high impact polyvinylchloride (PVC) conforming to ASTM D1784, Type II, D4216.
  1. Thickness: 0.050-inch minimum
  2. Color: Off-white
  3. Size: 10-foot lengths.
  4. Cornerbeads: With perforated flanges.
    - a. Smallnose cornerbead; use unless otherwise indicated.
  5. Casing Beads: With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated.
    - a. Square-edge style; use unless otherwise indicated.
    - b. Bullnose style, radius 3/4-inch minimum; use at locations indicated on Drawings.
  6. Control Joints: One-piece-type, folded pair of unperforated screeds in V-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
  7. Expansion Joints: Two-piece type, formed to produce slip-joint and square-edged 1/2-inch wide reveal; with perforated concealed flanges.
  8. Connectors
    - a. Connector Clips: Polyvinylchloride (PVC) plastic clips for aligning continuous lengths of molding.
    - b. Notch-Lok Connections: Polyvinylchloride back plates for aligning intersecting lengths of moldings.
    - c. "+" and "T" Intersections: Factory fabricated intersections used to connect horizontal and vertical joints of moldings.
  9. Soffit Vent: 4" wide continuous by depth to match soffit material depth with double leg channels mounting channels where indicated.

10. Manufacturer is as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
  - a. Vinyl Corp.
  - b. Plastic Components, Inc.
  - c. MarinoWare
  - d. Amico, A Gibraltar Industries Co.
- B. Reveals
  1. Basis of Design: "Channel Reveal" as manufactured by Vinyl Corp.
    - a. Material: Extruded vinyl.
    - b. Size: 1/2", model no. DC50-50S
    - c. Location: As indicated on drawings.

## 2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape Locations
  1. Interior Paper-Faced Gypsum Board: Paper.
  2. Exterior Gypsum Soffit Board: Paper.
  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. Prefilling, Open Joints and Damaged Areas: Use setting-type taping compound.
  2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners and trim flanges, use drying-type, all-purpose 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, ready mix drying-type, all-purpose compound.
  5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.
  6. Embedding, Fill and Finish Coat: For embedding mesh and finish coats on joints, fasteners, and trim flanges, use quick set compound without cellulose content.
- D. Joint Compound for Exterior Applications:
  1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
  2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.
- E. 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 TEXTURE FINISHES

- A. Non-Aggregate Finish: Premixed, vinyl texture finish for spray application.
  - 1. Texture: Orange Peel or Light spatter.
  - 2. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. CertainTeed Corp.; ProRoc Easi-Tex Spray Texture.
    - b. National Gypsum Company: Perfect Spray EM Texture.
    - c. USG Corporation; BEADEx FasTex Wall and Ceiling Spray Texture.

## 2.8 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
  - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- B. Screws for Gypsum Board (ASTM C1002): Phillips head galvanized steel Type self-drilling screws, length and type as required and recommended by gypsum board manufacturer.
  - 1. Type S-12, Bugle head, self-tapping, rust-resistant, fine tread for heavy gauge steel.
  - 2. Type S, bugle head, rust resistant, sharp point, and fine thread for light gauge steel or furring.
- C. Joint Paper Tape: 2 inch wide paper tape with center crease and buffed on both sides, comply with ASTM C475.
- D. Spot Grout: ASTM C475, setting type joint compound recommended for spot grouting hollow metal doorframes.
- E. Asphalt Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), non-perforated.
- F. Gypsum board sheathing sealants, caulk, tape:
  - 1. Don Corning 795 or equivalent; Pecora 895 or equivalent
  - 2. Borden HPPG Elmer's siliconized acrylic latex caulk or equivalent.
  - 3. 2" wide 10 x 10 glass mesh quick tape or equivalent.
- G. Adhesive: Adhesive for adhering gypsum board to masonry and concrete shall be as recommended by the gypsum board manufactures.

## 2.9 ACOUSTICAL MATERIALS

- 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, provide one of the following:
    - a. Sherwin Williams "Powerhouse Siliconized Acrylic Latex Sealant"

- b. Pecora Corporation "AC-20 FTR"
- c. USG Corporation "SHEETROCK Acoustical Sealant"
2. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E90.
3. Product has flame spread and smoke developed ratings of less than 25 per ASTM E84.
  
4. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, non-hardening, non-skinning, non-staining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

B. Glass-Fiber Acoustical Blanket Insulation

1. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
2. Size: 3 1/2" and 6" thick and as indicated.
3. Install in stud walls and other locations as indicated.

C. Sound-Attenuation Blankets

1. Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without facing membrane), unless noted otherwise.
2. Mineral-Fiber Type: Fibers manufactured from glass, slag wool, or rock wool.
  - a. Where used in fire-resistance rated assemblies, mineral fiber types shall correspond with requirements of tested assemblies.
3. Attenuation Location: Install in stud walls in a thickness to match stud size and provide between mechanical rooms and adjacent interior spaces.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Spot grout fill interior metal frames in gypsum wallboard partitions with gypsum board compound at hinge and strike locations. Fully fill interior frames with gypsum board compound and mechanical room walls.
- C. 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.

- D. 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.
- E. 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.
- F. Form control and expansion joints with space between edges of adjoining gypsum panels.
- G. 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.
- H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch 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.
- I. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- J. Hold gypsum board 1/2" off of floor. Bottom of all gypsum board panels to slab shall receive a continuous bead of sealant with a smooth finish aligned with the finished face of the gypsum board.
- K. 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.
- L. Install acoustical blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.
- M. Install attenuation blankets in stud walls between mechanical rooms and adjacent interior spaces.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
  - 1. Wallboard Type: As indicated on drawings.
  - 2. Moisture- and Mold-Resistant Type: In areas subject to moisture and as indicated on Drawings.
- 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 vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
  - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
  - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws at 12" o.c.

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 CONTROL JOINTS

A. Provide control joints in gypsum board partitions, bulkheads, ceilings, and soffits as follows:

1. Partition, furring, or column fireproofing abuts a structural element (except floor) or dissimilar wall or ceiling.
2. Ceiling or soffit abuts a structural element, dissimilar wall or partition or other vertical penetration.
3. Construction changes within plane of partition or ceiling.
4. Partition or furring run exceeds 40 feet, unless noted otherwise.
5. Ceilings with perimeter relief when dimensions exceeds 50 feet in either direction.
6. Ceilings without perimeter relief when dimensions exceeds 30 feet in either direction.
7. Soffits that exceed 30 feet in length.
8. Exterior soffits exceed 30 feet in either direction.
9. Wings of "L", "U", and "T"-shaped ceiling areas are joined.
10. Ceiling between two ends of walls.
11. Top corners of both sides of recessed door entries.
12. Expansion or control joints occur in the exterior wall.
13. Less than ceiling height frames should have control joints extending to the ceiling from both corners. Ceiling height door frames may be used as control joints. Treat window openings in same manner as doors.
14. USG Control Joint No. 093: Apply over face of gypsum board where specified. Cut to length with a fine-toothed hacksaw (32 teeth per inch). Cut end joints square, butt together, and align to provide neat fit. Attach control joint to gypsum board with fasteners spaced 6 inches o.c. maximum along each flange. Remove plastic tape after finishing with joint compound or veneer finish.
  - a. Leave a 1/2 inch continuous opening between gypsum boards for insertion of surface-mounted joint.
  - b. Interrupt wood floor and ceiling plates with a 1/2 inch gap, wherever there is a control joint in the structure.
  - c. Do not attach gypsum board to steel studs on one side of control joint.
  - d. Provide separate supports for each control joint flange.

- e. Provide an adequate seal behind control joint where sound or fire ratings are prime considerations.

### 3.5 APPLYING TILE BACKING PANELS

- A. Tile Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations. Apply joint tape over gypsum board joints and finish with compound per manufacturer's instructions.
- B. 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.

### 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. Prefill open joints, rounded or beveled edges, 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 2: Tile backing panels.
  - 3. Level 3: Mechanical, Electrical Rooms, Storage Rooms, and where indicated.
  - 4. Level 4: All other spaces unless indicated otherwise.
  - 5. Level 5: None.

### 3.8 FINISHING GYPSUM BOARD ASSEMBLIES

- A. Levels of Finish: The following levels of finish are established as a guide for specific final finishes in accordance with GA-214.
  - 1. Level 0: No taping, finishing, or accessories required. This level of finish shall be used in temporary construction only.
  - 2. Level 1: Joints and interior angles shall have tape embedded in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. This finish level shall be used in plenum areas above ceilings, in attics, in areas where the assembly is concealed.

3. Level 2: Joints and interior angles shall have tape embedded in joint compound, and one separate coat of joint compound applied over joints, angles, fastener heads, and accessories. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. This finish level shall be used where water resistant gypsum backing board (ASTM C630) is used as a substrate for tile only.
4. Level 3: Joints and interior angles shall have tape embedded in joint compound, and two separate coats of joint compound applied over joints, angles, fastener heads, and accessories. Joint compound shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a primer/sealer prior to the application of final finishes. See painting/wall covering specification in this regard. This final level shall be used in areas that are to receive heavy textured, thick (1/8 inch or greater) wall coverings.
5. Level 4: Joints and interior angles shall have tape embedded in joint compound, and three separate coats of joint compound applied over joints, angles, fastener heads, and accessories. Joint compound shall be smooth and free of tool marks and ridges. Note: Prepare surface to be coated with a primer/sealer prior to the application of final finishes. This finish level shall be used where textured finishes, wall coverings, and painted (flat or eggshell) finishes are to be applied.
6. Level 5: Joints and interior angles shall have tape embedded in joint compound and three separate coats of joint compound applied over joints, angles, fastener heads, and accessories. A thin skim coat of joint compound, or a material manufactured especially for this purpose, shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges. Note: Prepare surface to be coated with a primer/sealer prior to the application of finish paint. This finish level shall be used with semi-gloss or gloss painted finishes.

B. Use the following joint compound combination as applicable to the finish levels specified:

1. Embedding and First Coat: Setting type joint compound. Fill (Second) Coat: Setting type joint compound. Finish (Third) Coat: Ready mixed, drying type, all purpose or topping compound.

C. Provide Fire Rated/Smoke Barrier partition labeling as per signage specifications.

### 3.9 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.

3.10 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 09 29 00





## SECTION 09 30 00 – TILING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Porcelain tile.
    - b. Ceramic tile

#### 1.3 REFERENCES

- A. ANSI/CTI A108/A118/A136.1 – Specification for the Installation of Ceramic Tile - A Collection of 20 ANSI/CTI A108 Series Standards on Ceramic Tile Installation: A108.1A-C, 108.4 -.13, A118.1-.10, ANSI A136.1.
- B. ANSI/CTI A108.1 – Installation of Ceramic Tile with Portland Cement Mortar.
- C. ANSI/CTI A108.4 – Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile Setting Epoxy Adhesive.
- D. ANSI/CTI A108.5 – Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
- E. ANSI/CTI A108.6 – Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy.
- F. ANSI/CTI A108.8 – Installation of Ceramic Tile with Chemical Resistant Furan Mortar and Grout.
- G. ANSI/CTI A108.9 – Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout.
- H. ANSI/CTI A108.10 – Installation of Grout in Tile work.
- I. ANSI/CTI A118.1 – Dry-Set Portland Cement Mortar.
- J. ANSI/CTI A118.3 – Chemical Resistant, Water Cleanable Tile-Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive.
- K. ANSI/CTI A118.4 – Latex-Portland Cement Mortar.
- L. ANSI/CTI A118.6 – Ceramic Tile Grouts.
- M. ANSI/CTI A118.8 – Modified Epoxy Emulsion Mortar/Grout.
- N. ANSI/CTI A136.1 – Organic Adhesive for Installation of Ceramic Tile.
- O. ANSI/CTI A137.1 – Ceramic Tile.
- P. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.
- Q. ASTM C206 – Standard Specification for Finishing Hydrated Lime.
- R. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes.
- S. TCA CTI – (Tile Council of North America) - Handbook for Ceramic Tile Installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples: For tile, grout, and accessories involving color selection.
  - 1. Full-size units of each type and composition of tile and for each color and finish required.
  - 2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 12 inches by 36 inches square, but not fewer than four tiles. Use grout of type and in color or colors approved for completed Work.
  - 3. Full-size units of each type of trim and accessory for each color and finish required.
  - 4. Metal edge strips in 6-inch lengths.
- D. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- E. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certificate: Certify that products meet or exceed ANSI A137.1.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than five (5) years experience.
- B. Manufacturer's Qualifications: Experienced firm in the manufacture of products and/or systems similar to those required for this Project and with a record of successful in-service performance as well as sufficient production capacity to produce units as required.
- C. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- D. Installer's Qualifications: Work done under this Section of the Specifications shall be performed by mechanics skilled and experienced in the class of Work involved having successfully installed not less than 5 projects of similar size and scope to work of this Project. Installer shall be familiar with special requirements as herein indicated and shall comply with requirements of authorities having jurisdiction.
- E. Workmanship shall be in accordance with best trade practices, and surface shall be true to line and free from waves and other imperfections. Joints between tiles shall be maintained uniform and even and properly grouted.
- F. Work shall comply with applicable requirements of the following:
  - 1. Tile Council of North America (TCNA) Installation Guidelines.
  - 2. ANSI A108 Series.

1.7 MAINTENANCE MATERIALS

- A. Furnish extra materials described below that match products installed, packaged with protective covering for storage, and identified with labels describing contents.
- B. Furnish quantity of full-size units equal to 2.0% of amount installed.

1.8 MOCK-UPS

- A. Mockups: Before installing tile, construct mockups for each form of construction and finish required to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for completed Work.
  - 1. Locate mockups in the location and of the size indicated, or, if not indicated, as directed by Architect.
  - 2. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 3. Obtain Architect's approval of mockups before proceeding with final unit of Work.
  - 4. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
    - a. Approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.

1.9 PRE-INSTALLATION MEETING

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.

1.11 FIELD CONDITIONS

- A. This Contractor shall inspect the job condition before starting, and his starting work constitutes approval of conditions.
- B. All flooring variations less than 1/8" in 10 ft., chips, and cracks are the responsibility of the flooring subcontractor to feather/patch prior to the installation of tile.
- C. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.12 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be as indicated however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.

## 2.2 GENERAL

- A. Provide tile conforming to ANSI A137.1.
  - 1. Tile shall meet or exceed the ADAAG slip resistance coefficient of 0.42 or greater.

## 2.3 PORCELAIN TILE

- A. Tile Types
  - 1. (PT1) – Floor Tile.
  - 2. (PT2) – Wall Tile.
  - 3. (PT3) – Wall Tile.
- B. Ceramic/Porcelain Floor Tile: ANSI A137.1, conforming to the following:
  - 1. Basis of Design: “Uptown” as manufactured by Emser Tile.
  - 2. Moisture Absorption: 0 to 0.5 percent.
  - 3. Size: 18" x 35"
  - 4. Thickness: 3/8"
  - 5. Edge: Square.
  - 6. Pattern: As shown on the drawings.
  - 7. Joints: 1/8"
  - 8. Color: As indicated on drawings or as selected by the Architect.

## 2.4 CERAMIC TILE

- A. Ceramic Tile Base (CT1)
  - 1. Basis of Design: “Semi-Gloss” by Daltile
  - 2. Modular Size: 6 inches by 6 inches
  - 3. Thickness: 5/16 inch
  - 4. Joint Width: 1/8 inch
  - 5. Grout: SpectraLOCK
  - 6. Color: See drawings for selection or as selected by the Architect.

## 2.5 TILE TRIM

- A. Wall Tile Trim, provide the following:
  - 1. Trim in a size, color, and shade to match field tile.
  - 2. Bull nose wainscot cap where required.
  - 3. In a standard, square top, cove base at tile floors.
  - 4. In a square top, set-on type, cove base at other floors.
  - 5. Square edges at inside corners.
  - 6. Bull nose edges at outside corners and jambs.

## 2.6 MATERIALS

- A. Anti-Fracture Membrane/Cleavage Membrane: As required for isolating the installation from cracking due to minor substrate movement and normal structural deflections. Apply at crack locations.
  - 1. Membrane: Liquid applied elastomeric membrane complying with ASTM C627 and ASTM E96 Method E "Mapelastastic AuqaDefense" as manufactured by Mapei Corporation.
- B. Waterproof Membranes:
  - 1. Install beneath tile at group restrooms, single restrooms with drains and second floor restrooms.
  - 2. General: Provide products that comply with ANSI A118.10.
  - 3. Membrane: Liquid applied elastomeric membrane complying with ASTM C627 and ASTM E96 Method E "Mapelastastic AuqaDefense" as manufactured by Mapei Corporation.
- C. Self-Leveling Underlayment: Quick set type, as recommended by membrane manufacturer, required to provide a flat, level surface for direct receipt of tile and other floor coverings on dry, interior installations.
- D. Latex Underlayment: Quick set type, as recommended by membrane manufacturer, as required providing positive drainage to floor drains.
- E. Modified Dry-Set Mortar (Thinset): ANSI A118.4.
  - 1. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
  - 2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.
- F. Medium-Bed Modified Dry Set Mortar: Comply with ANSI A118.4, large tile
- G. Mortar Bed Installations: As indicated on the drawings, and elsewhere as required for mortar bed or brown coat as the substrate for tile work; work to conform to ANSI A108.1.
- H. Organic Tile Adhesives: ANSI A136.1 thinset bond type, use Type 1 in areas not exposed to prolonged moisture.
- I. Epoxy Adhesives: Chemical Resistant Epoxy, Water-Cleanable Tile Setting Epoxy as required for setting tile as specified by ANSI A118.3 and ANSI A108.6. Product shall be "Latapoxy 300" as manufactured by Laticrete or approved equal. Provide in restrooms and where indicated.
  - 1. Provide at restrooms.
- J. Unsanded Tile Grout: ANSI A118.7.
  - 1. Polymer Type: Ethylene vinyl acetate or acrylic additive, in dry, redispersible form, prepackaged with other dry ingredients. Product shall be Laticrete 1600 as manufactured by Laticrete or approved equal.

- K. Epoxy Grout: Chemical Resistant Epoxy, Water-Cleanable Tile Grouting Epoxy as required for grouting tile as specified by ANSI A118.3 and ANSI A108.6. Product shall be "SpectraLOCK Pro" as manufactured by Laticrete or approved equal. Provide in restrooms and where indicated.

- 1. Provide at restrooms.

- L. Elastomeric Joint Caulk: ANSI A108.01.3.7, provide in all joints between floors and walls and at joints between tile and dissimilar materials and as indicated on the drawings.

## 2.7 ACCESSORIES

- A. The Contractor to supply all necessary base, cap edge corner, trim, or accessory tiles required for a complete installation.

- B. Edge Trim:

- 1. Basis of Design: The basis of design product "Profiles" is manufactured by Schluter. Equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
  - 2. Material: Extruded aluminum, satin nickel anodized aluminum finish, profile Q80AT mechanically fastened, gluing is not permitted.
  - 3. Provide at all edges unless indicated otherwise.
  - 4. Install 1/4" profile at all material transitions.
  - 5. Install 1/4" profile at all outside corners in tiled walls.

- C. Grout Sealer: Manufacturer's standard product for cleaning, brightening, and sealing grout joints that does not change color appearance of grout.

- 1. Penetrating Sealer – for quarry and other Vitreous, Semi-Vitreous & Non – Vitreous Tile.
  - 2. Manufacturers and products are as indicated however equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
    - a. Bonsal, W. R., Company; Exterior Grout Sealer.
    - b. Bostik: Ceramaseal grout sealer.
    - c. Jamo Inc. Matte finish penetrating sealer.

## 2.8 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturer's written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

## 2.9 ENVIRONMENTAL

- A. Adhesives: For adhesives and sealants, including printed statement of VOC content.

- B. Urethane Crack Isolation Membrane and Tile-Setting Adhesive: One-part, liquid-applied urethane, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), in a consistency suitable for trowel application and intended for use as both waterproofing and tile-setting adhesive in a two-step process.
- C. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Organic Adhesive: ANSI A136.1, Type I, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Prior to installing tile, inspect new surfaces that are to receive tile covering. Notify the Architect in writing of defects or conditions that will interfere with or prevent a satisfactory tile installation. Do not proceed with installation until such defects or conditions have been corrected.
  - 1. Verify that substrates for setting tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 series of tile installation standards for installations indicated.
  - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
  - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust latter in consultation with Architect.
- B. The starting of installation work in a room or space shall imply acceptance of the surfaces to receive the tile in that space.

#### 3.2 PREPARATION

- A. Repair minor holes, cracks, depressions, and rough areas, using leveling and patching compounds as recommended by tile manufacturer.
- B. Clear away debris, scrape up cementitious deposits from surface that would prevent bond, including curing compounds, paint, oils, waxes, and sealers. Broom clean or vacuum surfaces to be covered immediately before installation.
- C. Field Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent adhesion or staining of exposed tile surfaces by grout, protect exposed surfaces of tile against adherence of mortar and grout by precoating them with a continuous film of temporary protective coating indicated below, taking care not to coat unexposed tile surfaces:
  - 1. Petroleum paraffin wax or grout release.

#### 3.3 INSTALLATION

- A. Install tile, per TCA F113-90 sloping to floor drains, where applicable, in accordance with ANSI specification A-108.5.



- B. Install edge trim where tile abuts other floor finishes.
- C. Install thresholds at all wall openings to restrooms and where tile abuts other floor finishes.
- D. Provide a 1/8" joint between the tile, and the doorframe or other item of dissimilar material then use a sealant over the joint instead of grout.
  - 1. Caulk the joints with caulking compound that matches grout.
- E. Use masonry saw to cut tile unless Architect and Owner approve another method.
- F. Floor tile in toilet rooms shall be epoxy grouted.
- G. Extend tile work into recesses and under or behind equipment and fixtures to form a complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- H. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are the same size. Lay out tile work and center tile fields in both directions.
- I. Cove base shall be installed flush with the adjacent floor tile and not on top of the floor tile.

### 3.4 LAYOUT

- A. Locate expansion joints and other sealant filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw cut joints after installation of tiles.
  - 1. Locate joints in tile surfaces directly above joints in concrete surfaces.
  - 2. Prepare joints and apply sealants to comply with requirements of Specification Section - Joint Sealants.
- B. Lay out tilework so as to minimize cuts less than one-half tile in size.
- C. Locate cuts in both walls and floors so as to be least conspicuous.
- D. Lay out tile wainscots to next full tile beyond dimensions shown.
- E. Align wall joints to give straight, uniform grout lines, plumb and level.
- F. Align floor joints to give straight uniform grout lines parallel with walls.
- G. Make joints between tile sheets same width as joints within sheets so extent of each sheet is not apparent in finished work.
- H. Porcelain tile can have large variances in sizing. Do not mix sizes and types of tiles in pattern areas. Joints that do not line up or joint widths that vary will be unacceptable.

### 3.5 WORKMANSHIP

- A. Supply first-class workmanship in tilework.

- B. Use products in strict accordance with recommendations and directions of manufacturer.
- C. Proportion mixes in accordance with latest ANSI standard specifications.
- D. Smooth exposed cut edges.
- E. Be sure cut edges are clean before installing tiles.
- F. Fit tile carefully against trim and accessories, also around pipes, electrical boxes, and other built-in fixtures so that escutcheons, plates, and collars will completely overlap cut edges.
- G. When using glazed tile sheets, minimize tearing sheets apart by drilling pipe holes as much as possible.
- H. Be sure tile work is free of grout film upon completion.

### 3.6 WATERPROOFING INSTALLATION

- A. Install waterproofing to comply with waterproofing manufacturer's written instructions to produce a waterproof membrane of uniform thickness bonded securely to substrate.
- B. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

### 3.7 ANTI-FRACTURE MEMBRANE/CLEAVAGE MEMBRANE

- A. Install anti-fracture membrane/cleavage membrane to comply with manufacturer's written instructions over cracks in the substrate.

### 3.8 FLOOR TILE INSTALLATION

- A. General: Install tile to comply with requirements in the Ceramic Tile Floor Installation Schedule, including those referencing TCA installation methods and ANSI A108 series of tile installation standards.

### 3.9 WALL TILE TRIM INSTALLATION

- A. Install wall tile trim per manufacturer's directions and locate joints at lower portion of wall.

### 3.10 WALL TILE INSTALLATION

- A. Install types of tile designated for wall installations to comply with requirements in the Ceramic Tile Wall Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.

### 3.11 GROUTING

- A. Grouting shall be installed in accordance with ANSI A108.10 and the manufacturer's recommended procedures and precautions during application and cleaning, unless noted otherwise.
- B. Where noted, for chemical-resistant epoxy grouts, comply with ANSI A108.6.
- C. Rinse tilework thoroughly with clean water before and after using chemical cleaners.

### 3.12 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all tile surfaces so they are free of foreign matter.
  - 1. Remove latex-Portland cement grout residue from tile as soon as possible.
  - 2. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
  - 3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to brick and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work.
- C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, to ensure tile is without damage or deterioration at the time of Substantial Completion.
  - 1. When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
  - 2. Prohibit foot and wheel traffic from tiled floors for at least 7 days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.
- E. All cleaning solutions and procedures to be in compliance with project IAQ Management Plan.

### 3.13 PROTECTION

- A. The Contractor installing tile shall make such provisions as necessary to protect the tile against damage of any kind after installation. Damaged tile that appears in the finish work prior to turning the building over to the Owner is to be repaired or replaced by this Contractor without further cost to the Owner. Protect adjoining areas and surfaces and clean up everything at completion. Remove scrap, debris, and surplus material as it accumulates.

3.14 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 09 30 00

## SECTION 09 51 23 – ACOUSTICAL TILE CEILINGS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Acoustical tiles for ceilings.
  - b. Suspension systems.

#### 1.3 REFERENCES

- A. ASTM C423 – Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- B. ASTM C635 – Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
- C. ASTM C636 – Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- D. ASTM C641-09 – Specification for Steel Sheet, Zinc-Coated (galvanized) Carbon Steel Wire.
- E. ASTM D3273 – Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- F. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- G. ASTM E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- H. ASTM E 119 – Standard Test Methods for Fire Tests of Building Construction and Materials.
- I. ASTM E795 – Standard Practice for Mounting Test Specimens During Sound Absorption Tests.
- J. ASTM E1264 – Standard Classification for Acoustical Ceiling Products.
- K. ASTM E1414 – Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
- L. ASTM E1477 – Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating Sphere Reflectometer.
- M. Ceilings and Interior Systems Contractors Association (CISCA) – Acoustical Ceilings: Use and Practice.
- N. UL – Fire Resistance Directory.
- O. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples:
  - 1. Acoustical Tiles: Set of full-size Samples of each type, color, pattern, and texture.
  - 2. Suspension-System Members: 6-inch long Sample of each type.
  - 3. Moldings and Trim: Set of 6-inch long Samples of each type and color.
- C. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- D. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  - 1. Ceiling suspension-system members.
  - 2. Method of attaching hangers to building structure.
    - a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
  - 3. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
  - 4. Size and location of initial access modules for acoustical tile.
  - 5. Ceiling-mounted items and items penetrating the ceiling including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
  - 6. Minimum Drawing Scale: 1/8 inch = 1 foot.

- B. Product Test Reports: For each acoustical tile ceiling, for tests performed by a qualified testing agency.
- C. Evaluation Reports: For each acoustical tile ceiling suspension system and anchor and fastener type, from ICC-ES.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Employ only licensed Sub-Contractors skilled in successful installations of the specified products on comparable projects for a minimum of five (5) years.
- B. Manufacturer's Qualifications: Employ only manufacturers making the specified products as a regular and current production item.
- C. Single-Source Responsibility for Ceiling and suspension Units: Obtain each type of acoustical ceiling unit and suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

#### 1.7 PRE-INSTALLATION MEETING

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

#### 1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Acoustical Ceiling Units: Full-size tiles equal to 2 percent of quantity installed, minimum two full boxes.
  - 2. Suspension-System Components: Quantity of each concealed grid and exposed component equal to 2 percent of quantity installed.
  - 3. This stock shall be designated for use by Owner only, after completion of the Project and shall not be used for repair or replacement during the one-year warranty period.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Handle acoustical tiles carefully to avoid chipping edges or damaging units in any way.

#### 1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
  - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical tile ceiling installation.
- B. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system components, and partition system.

#### 1.11 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's warranty that the ceiling panels and suspension systems shall be free from sagging or warping for indicated warranty.
  - 1. Warranty Period: Not less than ten (10) years from the Date of Substantial Completion.

#### 1.12 PERFORMANCE

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: Class A according to ASTM E 1264.
  - 2. Smoke-Developed Index: 50 or less.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Manufacturer shall be as indicated however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Armstrong World Industries
  - 2. Manufacturers as indicated
  - 3. CertainTeed Corporation
  - 4. USG Interiors, Inc.
  - 5. Gold Bond – National Gypsum
  - 6. Rockfon



## 2.2 ACOUSTICAL TILES, GENERAL

- A. Acoustical Tile Standard: Provide manufacturer's standard tiles of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.
  - 1. Where appearance characteristics of acoustical tiles are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.
- B. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273, ASTM D 3274, or ASTM G 21 and evaluated according to ASTM D 3274 or ASTM G 21.
- C. Mounting Method for Measuring NRC: Type E 400 (plenum mounting in which face of test specimen is 15-3/4" away from the test surface) per ASTM E 795-05(12).

## 2.3 ACOUSTICAL TILES

- A. ACT-1:
  - 1. Basis of Design: "Pacific #SL260" as manufactured by Rockfon
  - 2. Edge: Tegular
  - 3. Size: 24" x 24" x 1/2"
  - 4. NRC: 0.60
  - 5. Color: White
- B. ACT-2:
  - 1. Basis of Design: "Tropic #SL1060" as manufactured by Rockfon
  - 2. Edge: Tegular
  - 3. Size: 24" x 24" x 5/8"
  - 4. NRC: 0.85
  - 5. Color: White
- C. ACT-3:
  - 1. Basis of Design: "School Zone Fine Fissured #1820" as manufactured by Armstrong World Industries
  - 2. Edge: Tegular
  - 3. Size 24" x 24" x 3/4"
  - 4. NRC: 0.70
  - 5. Color: White

## 2.4 METAL SUSPENSION SYSTEMS

- A. Basis of Design: "Prelude XL 15/16" Steel" as manufactured by Armstrong World Industries

- B. Metal Suspension-System Standard: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.
  - 1. Electrogalvanized in all spaces unless indicated otherwise.
  - 2. Hot-dipped galvanized shall be used in the food service related areas.
- C. High-Humidity Finish: Provide coating tested and classified for "severe environment performance" according to ASTM C 635/C 635M in food service, damp and potentially wet spaces.
  - 1. Provide aluminum cap in food preparations areas and associated spaces.
  - 2. Provide aluminum cap in spaces that may experience damp or wet conditions.
- D. Structural Classification: Intermediate Duty System.
- E. End Condition of Cross Runners: Override (stepped) or butt-edge type, as standard with manufacturer.
- F. Color: White.

## 2.5 METAL EDGE MOLDINGS AND TRIM

- A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations complying with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for of suspension-system runners.
- B. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
- C. Provide manufacturer's standard edge moldings that fit acoustical tile edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.
- D. Ceiling Edge Trim: Provide "Straight Axiom Classic Trim" as manufactured by Armstrong World Industries.
  - 1. Provide outside and inside corner trim, splice plates, clips and miscellaneous items for a complete installation.
  - 2. Size: 7-13/16" and 14" and as indicated on the drawings.
  - 3. Color: As selected by the Architect.

## 2.6 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488/E 488M or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
  - a. Type: Post-installed expansion anchors.
  - b. Corrosion Protection: Carbon-steel components zinc plated according to ASTM B 633, Class SC 1 (mild) service condition.
2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.

B. Wire Hangers, Braces, and Ties: Provide wires as follows:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106 inch diameter wire.

C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch diameter bolts.

## 2.7 ACOUSTICAL SEALANT

- A. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90. Exposed and concealed joints nonsag, paintable, nonstaining latex sealant.

## 2.8 ENVIRONMENTAL

- A. Recycled Content: Provide acoustical panels with recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content constitutes a minimum of 20 percent by weight.
- B. Adhesives: For adhesives, sealants and chemical-bonding compounds, including printed statement of VOC content.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders, and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

### 3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

- A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 2. Splay hangers only where required and no more than 20 degrees to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
  - 4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  - 6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, post-installed mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.

7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  8. Do not attach hangers to steel deck tabs.
  9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  10. Do not place hanger wires thru cable trays or attach to cable trays and conduits or other similar items.
  11. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
  12. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
  13. Secure wire hangers to the four corners of all light fixtures.
- B. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.
- C. Install edge moldings and trim of type indicated at perimeter of acoustical tile ceiling area and where necessary to conceal edges of acoustical tiles.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
  2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
  3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
  4. All seams to be tight and flush.
- D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- E. Arrange directionally patterned acoustical tiles as follows:
1. Install tiles in a basket-weave pattern – verify with Architect.
- F. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges so tile-to-tile joints are closed by double lap of material.
1. Fit adjoining tile to form flush, tight joints. Scribe and cut tile for accurate fit at borders and around penetrations through tile.
- 3.4 ERECTION TOLERANCES
- A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.
- B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

### 3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections of completed installations of acoustical tile ceiling hangers and anchors and fasteners in successive stages and when installation of ceiling suspension systems on each floor has reached 20 percent completion but no tiles have been installed. Do not proceed with installations of acoustical tile ceiling hangers for the next area until test results for previously completed installations of acoustical tile ceiling hangers show compliance with requirements.
  - 1. Within each test area, testing agency will select one of every 10 power-actuated fasteners and post-installed anchors used to attach hangers to concrete and will test them for 200 lbf of tension; it will also select one of every two post-installed anchors used to attach bracing wires to concrete and will test them for 440 lbf of tension.
  - 2. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.
- B. Acoustical tile ceiling hangers and anchors and fasteners will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

### 3.6 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 09 51 23

## SECTION 09 51 25 – ACOUSTICAL CEILING CLOUDS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Acoustical ceiling cloud panels.
    - b. Suspension system.

#### 1.3 REFERENCES

- A. ASTM A 1008 – Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- B. ASTM A 653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
- C. ASTM C 423 – Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- D. ASTM C 635 – Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- E. ASTM C 636 – Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
- F. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- G. ASTM E 1264 – Classification for Acoustical Ceiling Products.
- H. ASTM E 1477 – Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- I. ASTM D 3273 – Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- J. NFPA 286 – Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

#### 1.4 ACTION SUBMITTALS

- A. Product data for each type of product specified.

- B. Samples: For each type of exposed finish required, prepared on samples of size indicated below and of same thickness and material indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing full range of variations expected.
  - 1. 6" square samples of each acoustical panel type, pattern, and color.
  - 2. Set of 12" long samples of exposed suspension system members, including moldings, for each color and system type required.

#### 1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide cloud suspension system and panels by a single manufacturer.
- B. Fire Performance Characteristics: The fire performance of Infusions Lay-In Panels meets the requirements for light transmitting plastics in Chapter 26 of the International Building Code. Infusions panels have been tested according to NFPA 286 and are equivalent to Class A Interior Finish as defined in Chapter 8 of the International Building Code.
- C. Coordination of Work: Coordinate cloud work with installers of related work including, but not limited to suspended ceilings, building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.
- D. Ceiling clouds, as with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern, or possibly delay or accelerate the activation of the sprinkler or fire detection systems by channeling heat from a fire either toward or away from the device. Designers and installers are advised to consult a fire protection engineer, NFPA 13, or their local codes for guidance where automatic fire detection and suppression systems are present.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cloud system and panels to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing clouds, permit them to reach room temperature and a stabilized moisture content.
- C. Handle components carefully to avoid damaging units in any way.

#### 1.7 PROJECT CONDITIONS

- A. Space Enclosure:
  - 1. Building areas to receive clouds shall be free of construction dust and debris. Products can be installed up to 100°F (38°C) and in spaces before the building is enclosed, where HVAC systems are cycled or not operating. Cannot be used in exterior applications where standing water is present or where moisture will come in direct contact with the canopy.



## 1.8 MAINTENANCE

- A. Operational Service: Provide manufacturer's maintenance agreement or take-back program service for acoustical ceiling tile installed in project. Service shall reclaim materials for recycling and/or reuse. Service shall not landfill or burn reclaimed materials.

## 1.9 EXTRA MATERIALS

- A. Furnish extra materials described below matching installed products, packaged with protective covering for storage, and are identified with labels describing contents.
  - 1. Acoustical Ceiling Units: Full size units equal to 2% of amount installed.
  - 2. Suspension System Components: Furnish quantity of each exposed component equal to 2% of amount installed.

## 1.10 WARRANTY

- A. Warranty: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to:
  - 1. Panels: Sagging and warping as a result of defects in materials or factory workmanship.
  - 2. Grid System: Rust and manufacturer's defects
  - 3. Acoustical Panels with BioBlock Plus or designated as inherently resistive to the growth of micro-organisms installed with Armstrong suspension systems: Visible sag and will resist the growth of mold/mildew and bacterial growth.
- B. Warranty Period:
  - 1. Formations with panels designated as HumiGuard Plus: Ten (10) years from date of substantial completion.
  - 2. Formations with metal panels, fabric panels and Infusions panels – one (1) year from date of substantial completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer shall be one of the following in each category however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Acoustical Suspension System and Suspension Trim
    - a. Armstrong World Industries, Inc.
  - 2. Acoustical Panels
    - a. CertainTeed

## 2.2 ACOUSTICAL PANEL CLOUD SYSTEM

- A. Basis of Design; "Formations Squares Acoustical Cloud Panel"
- B. Acoustical Cloud Panel System:
  - 1. Cloud Size: As indicated on drawings.
  - 2. Surface finish: Powder-coated finish
  - 3. Color: Colors shall be selected by the Architect from the manufacturer's complete color selections and shall include custom RAL colors.
- C. Acoustical Panel:
  - 1. Basis of Design: "Fine Fissured, HHF-150 Bioshield"
  - 2. Size: 24" x 24" x 3/4"
  - 3. NRC: 0.70
  - 4. Flame Spread: (Class A per ASTM E 84)
- D. Suspension System and Suspension Trim:
  - 1. Basis of Design: Superfine XL 9/16" Grid"
  - 2. All main beams and cross tees shall be commercial quality hot-dipped galvanized steel as per ASTM A 653. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel in baked polyester paint.
    - a. Color: See drawings for selection and as selected by the Architect.
  - 3. Edge Trim at Round Clouds:
    - a. Axiom Classic: 6"
    - b. Color: See drawings for color and color shall be a custom/RAL color as selected by the Architect.
    - c. Accessories: Provide manufacturer's standard splices, inside corners, outside corners and other items for a complete installation and match trim material and finish.
  - 4. Edge Trim at Rectangular Clouds
    - a. Trim: Axiom Knife Edge, 6" high
    - b. Trim: Axiom Classic, 6" high
    - c. Color: See drawings for color and color shall be a custom/RAL color as selected by the Architect.
    - d. Accessories: Provide manufacturer's standard splices, inside corners, outside corners and other items for a complete installation and match trim material and finish.
  - 5. Suspension Hardware:
    - a. StrongBack – Hot dipped galvanized cold rolled steel.
    - b. Cable Hardware – 2-1/16 inch x 1 inch x 3/8 inch quick loop wire rope clamp for 1/16 inch diameter cable.
    - c. Cable – 7 x 7 aircraft cable, 1/16 inch x 120 inch galvanized with loop at one end.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and structural framing to which ceiling system attaches. Do not proceed with installation until unsatisfactory conditions have been corrected.

- B. Above Ceiling Observation: Conduct an above ceiling observation before start of acoustical ceiling installation and report all deficiencies observed. Do not start work until unsatisfactory conditions have been corrected in an acceptable manner.
  - 1. No ceiling panel installation shall be performed until spaces are enclosed and dry, and all above ceiling work has been completed.

### 3.2 PREPARATION

- A. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
  - 1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.
- B. Application of materials shall be done by the manufacturer or his authorized applicator and in strict accordance with the manufacturer's specifications, except as herein modified.
- C. Install ceiling panels only after building HVAC system has been run continuously for 72 hours.

### 3.3 INSTALLATION

- A. Install materials per manufacturer's instructions.
- B. Secure suspension hangers to building structure above. Do not attach hanger wire to 1-1/2" metal roof deck, electrical, or mechanical equipment or related support systems.
- C. Install metal channel by saddle tying hanger wire or with leveling clips to a leveling tolerance of 1/8" in 12 feet each way.
- D. Install grid suspension system with no exposed fasteners, including pop rivets are allowed.
- E. Just before final acceptance, remove and replace skinned, damaged, or dirty panels.
- F. Install edge trim of type indicated at perimeter system.

### 3.4 FIELD QUALITY CONTROL

- A. At completion of work, installation shall comply with ASTM C635 for dimensional tolerances, coatings, and finishes and load carrying capacities and with the following:
- B. Ceilings shall be level with maximum tolerance of 1/8 inch per 10 ft. – 0 inches; discolored, broken or pierced ceiling panels shall be replaced.
- C. Suspension system shall be uniform in appearance; main runners shall be installed square and firmly interlocked with one another and shall be tightly secured to hangers; hangers shall not be kinked or bent to level ceiling grid; hangers shall only be attached to structural units; additional fixture loads shall require additional hanger supports to avoid deflection or rotation.

3.5 CLEANING

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace chipped, scratched and marred work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 25

## SECTION 09 65 13 – RESILIENT BASE AND ACCESSORIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Resilient base.
    - b. Accessories.

#### 1.3 REFERENCES

- A. ASTM D570 – Standard Test Method for Water Absorption of Plastics.
- B. ASTM E 662 – Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- C. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- D. ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- E. ASTM F1515 – Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Changes.
- F. ASTM F 1861 – Standard Specification for Resilient Wall Base.
- G. NFPA 253 – Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- H. NFPA 258 – Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- I. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color selected, not less than 12 inches long.
- C. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.

3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

D. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:

1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

#### 1.6 PRE-INSTALLATION MEETING

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

#### 1.8 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F for more than 95 deg F, in spaces to receive resilient products during the following time periods:
1. 48 hours before installation.
  2. During installation.

3. 48 hours after installation.

- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

#### 1.9 WARRANTY

- A. Furnish manufacturer's warranty covering manufacturing defects for a period of 2 years and 10 years for traffic wear resistance, excluding abusive treatment.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Manufacturer shall be one of the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.

- 1. Johnsonite; A Tarkett Company
- 2. Roppe Corporation, USA
- 3. Burke Mercer Flooring Products

#### 2.2 BASE (RC)

- A. Product Standard: Vinyl ASTM F1861, Type TV (Vinyl), Group I (solid, homogeneous)
- B. Type: Cove
- C. Thickness: 1/8 inch.
- D. Height: 4 inches.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.
- H. Colors: See drawings for selection or as selected by the Architect.

2.3 BASE (RS)

- A. Product Standard: Rubber ASTM F1861, Type TP, Group 1 (Solid, homogeneous)
- B. Style: "Millwork – Reveal - No. MW-XX-F6" as manufactured by Johnsonite
- C. Thickness: 3/8 inch.
- D. Height: 6 inches.
- E. Outside Corners: Preformed.
- F. Inside Corners: Preformed.
- G. Lengths: 8'-0"
- H. Colors: See drawings for selection or as selected by the Architect.

2.4 FLOOR TRANSITIONS

- A. Description: Transitions, reducer, edge strips and adaptors strips as required to accommodate edge conditions and joints between different flooring materials.
- B. Vinyl Transitions
  - 1. Basis of Design: "Slim Line Reducer/Edge Strips"
  - 2. Profile and Dimensions: Provide profiles to fit conditions and as recommended by flooring installer unless indicated otherwise. Profile and width of height required to protect exposed edge of carpet and provide transition to adjacent materials, and of maximum lengths to minimize running joints. Final selection shall be as approval by the Architect.
  - 3. Locations: Provide at transition between floor types and at edges of floor covering that would otherwise be exposed unless indicated otherwise.
  - 4. Colors and Patterns: As selected by Architect from full range of industry color.

2.5 INSTALLATION MATERIALS

- A. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
- B. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

2.6 ENVIRONMENTAL:

- A. Adhesives: For adhesives, sealants and chemical-bonding compounds, including printed statement of VOC content.
- B. Compliance: Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):



1. VCT and Asphalt Tile Adhesives: Not more than 50 g/L.
  2. Rubber Floor Adhesives: Not more than 60 g/L.
- C. Chemical-Bonding Compound: Use chemical-bonding compound that has a VOC content of 350 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
1. Installation of resilient products indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Do not install resilient products until they are the same temperature as the space where they are to be installed.
1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- C. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

### 3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.

- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

#### 3.4 ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Butt to adjacent materials and tightly adhere to substrates throughout length of each piece.

#### 3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
  - 1. Remove adhesive and other blemishes from exposed surfaces.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

#### 3.6 INDOOR AIR QUALITY

- A. Temporary ventilation: Provide temporary ventilation as specified – Indoor Air Quality (IAQ) Management, and as follows:
- B. Ventilate products prior to installation. Remove from packaging and ventilate in a secure, dry, well-ventilated space free from strong contaminant sources and residues. Provide a temperature range of 60 degrees F minimum to 90 degrees F maximum continuously for minimum 72 hours. Do not ventilate within limits of Work unless otherwise approved by Architect.

#### 3.7 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 09 65 13

## SECTION 09 65 16 – RESILIENT SHEET FLOORING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Resilient vinyl sheet flooring (VCS).

#### 1.3 REFERENCES

- A. ANSI ESD S97.2 Floor Materials and Footwear – Voltage Measurement on a Person.
- ASTM C423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- B. ASTM C518 – Standard Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
- C. ASTM D3389 – Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform, Double Head Abrader).
- D. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- E. ASTM E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- F. ASTM E648 – Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- G. ASTM E662 – Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- H. ASTM E1745 – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- I. ASTM E2179 – Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors.
- J. ASTM E2180 – Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials.
- K. ASTM F150 – Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring.
- L. ASTM F386 – Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces.
- M. ASTM F710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- N. ASTM F925 – Standard Test Method for Resistance to Chemicals of Resilient Flooring.
- O. ASTM F970 – Standard Test Method for Static Load Limit.

- P. ASTM F1514 – Standard Test Method for Measuring Heat Stability of Resilient Flooring by Color.
- Q. ASTM F1869 – Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- R. ASTM F1913 – Standard Specification for Vinyl Sheet Floor Covering Without Backing.
- S. ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- T. ASTM F2199 – Standard Test Method for Determining Dimensional Stability of Resilient Floor Tile after Exposure to Heat.
- U. ASTM F3010 – Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings.
- V. ASTM G21 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- W. FTM 101 C 4046 Static Decay.
- X. ISO 140 – Measurement of Sound Insulation in Buildings and of Building Elements.
- Y. NFPA 253 – Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source.
- Z. NFPA 258 – Test Method for Specific Density of Smoke Generated by Solid Materials.
- AA. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of flooring. Include flooring layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
- C. Samples: For each exposed product and for each color and texture specified in manufacturer's standard size, but not less than 6" x 6" sections.
  - 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.
- D. Welded-Seam Samples: For seamless-installation technique indicated and for each resilient sheet flooring product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch. Sample applied to a rigid backing and prepared by Installer for this Project.
- E. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- F. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500-mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional

materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:

1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of resilient sheet flooring to include in maintenance manuals.

#### 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Resilient Sheet Flooring: Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, in roll form and in full roll width for each color, and pattern of flooring installed.

#### 1.8 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- C. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.
  1. Engage an installer who employs workers for this Project who are trained or certified by resilient sheet flooring manufacturer for installation techniques required.
- D. Single-Source Responsibility for Flooring: Obtain each type, color, and pattern of flooring from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

- E. Installer's Qualifications: Employ only authorized representative of resilient flooring manufacturer for installation and maintenance of units required for this Project.
  - 1. Employ only experienced Contractors (Installers) skilled in the successful installation of the specified materials and accessories on similar projects for a minimum of five years.
- F. Manufacturer's 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.
- G. Bond and Moisture Tests: Contractor shall provide bond and moisture tests before the installation of the resilient flooring. Bond and moisture tests shall be in strict accordance with the resilient flooring manufacturer's recommendations. Provide amount of tests as recommended by the resilient flooring manufacturer.

#### 1.9 PRE-INSTALLATION MEETING

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver flooring and installation accessories to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store flooring materials in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F and 90 deg F.
- C. Store flooring on flat surfaces. Move flooring and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

#### 1.11 EXTRA MATERIALS

- A. Furnish to Owner, not less than 5% of total floor area receiving resilient flooring for each color, pattern and size of resilient floor installed.

#### 1.12 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store rolls upright.

#### 1.13 WARRANTY

- A. Provide current, detailed manufacturer's warranty for each flooring product as applicable, including limited wear, defect and conductivity for a period of five (5) years.

#### 1.14 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient sheet flooring during the following time periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. Do not install flooring until they are at the same temperature as the space where they are to be installed.
- C. Do not install flooring over concrete slabs until the slabs have cured and are sufficiently dry to bond with adhesive as determined by manufacturer's recommended bond and moisture test.
- D. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F
- E. Close spaces to traffic during resilient sheet flooring installation and for 48 hours after resilient sheet flooring installation.
- F. Install resilient sheet flooring after other finishing operations, including painting, have been completed.

#### 1.15 PERFORMANCE

- A. Fire Performance Characteristics: Provide resilient flooring with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E648.
  - 2. Smoke Density: Less than 450 per ASTM E662.
  - 3. Flame Spread: Less than 75 per ASTM E84.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Armstrong World Industries
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Tarkett Commercial

## 2.2 VINYL COMPOSITION SHEET (VCS)

- A. Basis of Design: "Medintech"
- B. Composition: Homogeneous sheet flooring shall conform to the requirements of ASTM F1913.
- C. Thickness: 0.080".
- D. Sheet Width: 6 feet.
- E. Seamless-Installation Method: Heat welded.
- F. Base: Integral cove base.
- G. Colors and Patterns: As selected by the Architect.

## 2.3 INTEGRAL BASE

- A. Integral-Flash-Cove-Base Accessories For 4" High Base:
  - 1. Cove Strip: 1-inch (25-mm) radius provided or approved by manufacturer.
  - 2. Cap Strip: Square rubber cap provided by manufacturer.
  - 3. Corners: Prefabricated vinyl inside and outside corners and end stops provided by manufacturer.

## 2.4 INSTALLATION MATERIALS

- A. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.
- B. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.
- C. Resilient Sheet Flooring Seamless-Installation Accessories:
  - 1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
    - a. Color: As selected by Architect from manufacturer's full range.
- D. Floor Polish: Provide protective liquid floor polish products as recommended by manufacturer.
- E. Two Coat Moisture Control Coating System:
  - 1. 6.036 - KOSTER VAP I 2000 HS
  - 2. FLOOR SEAL MES 100
  - 3. ARDEX MC™ ULTRA Moisture Control System
  - 4. VEXON CHEMICALS MoistureBloc Emulsion Vapor Reduction System



2.5 FLOOR TRANSISTIONS

A. Vinyl Transitions

1. Description: Transitions, reducer, edge strips and adaptors strips as required to accommodate edge conditions and joints between different flooring materials
2. Basis of Design: "Slim Line reducer/edge strips"
  - a. Manufacturers: The basis of design products are manufactured by Johnsonite. Equal or better performing products of other manufacturers will be considered for acceptance by the architect
3. Profile and Dimensions: Provide profiles to fit conditions and as recommended by flooring installer unless indicated otherwise. Profile and width of height required to protect exposed edge of carpet and provide transition to adjacent materials, and of maximum lengths to minimize running joints. Final Selection shall be as approved by the Architect.
5. Locations: Provide at transition between floor types and at edges of floor covering that would otherwise be exposed unless indicated otherwise.
6. Colors and Patterns: As selected by Architect from full range of industry colors.

2.6 ENVIRONMENTAL

- A. Floorscore Requirements: The vinyl flooring shall meet testing and product requirements of the Resilient Floor Covering Institute (RFCI) in conjunction with Scientific Certification Systems (SCS).
- B. Adhesives: Adhesives for or site installation or factory fabrication: Submit manufacturer's documentation substantiating the following requirements for each type of materials provided per this specification:
- C. Data: Product data for adhesives as indicated.
- D. Submit manufacturer's certification that products comply with VOC limits when calculated according to 40CFR 59, Subpart D (EPA Method 24).
- E. Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
- F. Submit Green Seal Certification to GS-36 and description of the basis of certification.
- G. Submit manufacturer's certification that products comply with SCAQMD #1168. Submit manufacturer's certification that products comply with SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions do exist or direct exposure to moisture can occur, submit manufacturer's certification that products comply with Bay Area AQMD Reg. 8, Rule 51 for containers larger than 16 oz with California Air Resources Board (CARB) for containers 16 oz or less.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient sheet flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet flooring.
- B. Concrete Substrates: Prepare according to ASTM F 710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.
  - 3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
  - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to resilient sheet flooring manufacturer's written recommendations, but not less stringent than the following:
    - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient sheet flooring until it is the same temperature as the space where it is to be installed.
  - 1. At least 48 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

### 3.3 RESILIENT SHEET FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient sheet flooring.
- B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.
- C. Lay out resilient sheet flooring as follows:
  - 1. Maintain uniformity of flooring direction.
  - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in flooring substrates.
  - 3. Match edges of flooring for color shading at seams.
  - 4. Avoid cross seams.
- D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.
- E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.
- H. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to permanently fuse sections into a seamless flooring. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.
- J. Apply transition accessories at edges of carpeting materials and resilient flooring that would otherwise be exposed.
- K. Integral-Flash-Cove Base: Cove resilient sheet flooring 4 inches up vertical surfaces. Support flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.

### 3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.
- B. Perform the following operations immediately after completing resilient sheet flooring installation:
  - 1. Remove adhesive and other blemishes from surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.

3. Damp-mop surfaces to remove marks and soil.

- C. Protect resilient sheet flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

### 3.5 INDOOR AIR QUALITY

- A. Temporary ventilation: Provide temporary ventilation as specified – Indoor Air Quality (IAQ) Management, and as follows:
- B. Ventilate products prior to installation. Remove from packaging and ventilate in a secure, dry, well-ventilated space free from strong contaminant sources and residues. Provide a temperature range of 60 degrees F minimum to 90 degrees F maximum continuously for minimum 72 hours. Do not ventilate within limits of Work unless otherwise approved by Architect.

### 3.6 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 09 65 16

## SECTION 09 65 19 – RESILIENT TILE FLOORING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - 1. Luxury Vinyl Tile (LVT)
  - 2. Rubber Tile (RT)

#### 1.3 REFERENCES

- A. ASTM D570 – Standard Test Method for Water Absorption of Plastics.
- B. ASTM D2047 – Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
- C. ASTM E84 – Standard Test Method for the Surface Burning Characteristics of Building Materials.
- D. ASTM E 492 – for Impact Insulation.
- E. ASTM E 648 – Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source.
- F. ASTM E 662 – Test Method for Specific Density of Smoke Generated by Solid Materials.
- G. ASTM E1428 – Standard Test Method for Evaluating the Performance of Antimicrobials in or on Polymeric Solids Against Staining by Streptomyces Species (A Pink Stain Organism).
- H. ASTM F510/F510M – Standard Test Method for Resistance to Abrasion of Resilient Floor Covering Using an Abrader with a Grit Feed Method.
- I. ASTM F 710 – Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.
- J. ASTM F 970 – Test Method for Static Load Limit.
- K. ASTM F1066 – Standard Specification for Vinyl Composition Floor Tile.
- L. ASTM F1515 – Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Changes.
- M. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile.
- N. ASTM F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor using Anhydrous Calcium Chloride.
- O. ASTM F2055 – Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method.
- P. ASTM G21-15 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- Q. NFPA 253 – Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source.
- R. NFPA 258 – Test Method for Specific Density of Smoke Generated by Solid Materials.
- S. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Submit technical data on each item specified including certification by manufacturer that products supplied for installation comply with local regulations controlling use of volatile organic compounds (VOC's).
- B. Product Certificates: In lieu of laboratory test reports when permitted by Architect, signed by manufacturer certifying that each product complies with requirements.
- C. Samples: Manufacturer's color charts consisting of actual tiles or sections of tiles showing full range of colors and patterns available for each type of resilient floor tile indicated.
- D. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- E. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATION SUBMITTALS

- A. Test Results: Submit results from calcium chloride and bond and moisture tests as specified herein, before installation of resilient flooring.
- B. Installer Statement of Compliance: Certify tile is installed in accordance with manufacturer's installation manual in order to validate the manufacturer's warranty on installation integrity.
- C. Maintenance Data: Submit maintenance manuals for flooring materials provided to be included in Operation and Maintenance Manuals.
- D. Warranty: Submit sample of warranty.

1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- C. Single-Source Responsibility for Flooring: Obtain each type, color, and pattern of flooring from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- D. Installer's Qualifications: Employ only authorized representative of resilient flooring manufacturer for installation and maintenance of units required for this Project.
  - 1. Employ only experienced Contractors (Installers) skilled in the successful installation of the specified materials and accessories on similar projects for a minimum of five (5) years.
- E. Manufacturer's 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.
- F. Calcium Chloride Test: Contractor shall provide a calcium chloride test to measure moisture vapor emissions from the concrete slab on grade, before the installation of the resilient flooring. Maximum moisture emissions levels shall be as recommended by the resilient flooring manufacturer.
- G. Bond and Moisture Tests: Contractor shall provide bond and moisture tests before the installation of the resilient flooring. Bond and moisture tests shall be in strict accordance with the resilient flooring manufacturer's recommendations. Provide amount of tests as recommended by the resilient flooring manufacturer.

1.7 PRE-INSTALLATION MEETING

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver flooring and installation accessories to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store flooring materials in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F and 90 deg F.
- C. Store flooring on flat surfaces. Move flooring and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

1.9 FIELD CONDITIONS

- A. Maintain a minimum temperature of 70 deg F in spaces to receive flooring for at least 48 hours before installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 deg F.
- B. Do not install flooring until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during installation.
- D. Specified items shall not be delivered or installed until building is enclosed, wet work completed and HVAC system is operating and maintaining temperature and humidity at occupancy level during remainder of construction period.
- E. Do not install flooring over concrete slabs until the slabs have cured and are sufficiently dry to bond with adhesive as determined by manufacturer's recommended bond and moisture test.

1.10 EXTRA MATERIALS

- A. Furnish to Owner, not less than one box for each 50 boxes or fraction thereof, of each class, wearing surface, color, pattern and size of resilient floor tile installed.

1.11 WARRANTY

- A. Manufacturer's Warranty covering manufacturing defects and installation integrity shall be indicated warranty period. Installation integrity is defined as products installed in accordance with the manufacturer's installation manual.
  - 1. Warranty Period: Not less than twenty (20) years from Date of Substantial Completion.
- B. Installer's Warranty: Fully guarantee installation of tile and wall base against defects in installation, workmanship and loss of adhesion for indicated warranty period.
  - 1. Warranty Period: Not less than one (1) year from Date of Substantial Completion.

1.12 PERFORMANCE

- A. Fire Performance Characteristics: Provide resilient flooring with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E648.
  - 2. Smoke Density: Less than 450 per ASTM E662.
  - 3. Flame Spread: Less than 75 per ASTM E84.



## PART 2 – PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer shall be as indicated however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.

### 2.2 LUXURY VINYL TILE – (LVT1, LVT2 and LVT3)

- A. Basis of Design Pattern: “Riot Static” as manufactured by Tarkett (Tandus Centiva)
- B. Pattern: Graphic
- C. Composition: ASTM F1700, Class III.
- D. Thickness: .118”
- E. Wear layer thickness: 32 mil
- F. Installation: Glue down
- G. Size: 18 inches by 36 inches.
- H. Color: See drawings for selection or as selected by the Architect.
- I. Provide laser cut tile at entry logo, field cutting will not be permitted.

### 2.3 RUBBER TILE (RT1-RT2)

- A. Basis of Design: “Tuflex” as manufactured by Roppe Corporation
- B. Composition: ASTM F1700, Class 2 pattern through.
- C. Overall Thickness; 3/8”
- D. Finish: Smooth
- E. Size: 27" x 27"
- F. Color: See drawings for selection or as selected by the Architect.

### 2.4 MISCELLANEOUS MATERIALS

- A. Adhesive: Water-resistant type as recommended by product manufacturer. Water based adhesives are not allowed.
- B. Trowelable Leveling and Patching Compounds. Latex-modified, Portland cement based or blended hydraulic-cement-based formulation or approved by manufacturer for applications indicated, as required to level uneven subfloor conditions.

## 2.5 FLOOR TRANSITIONS

### A. Vinyl Transitions

1. Description: Transitions, reducer, edge strips and adaptors strips as required to accommodate edge conditions and joints between different flooring materials.
2. Basis of Design: "Slim Line Reducer/Edge Strips"
  - a. Manufacturers: The basis of design products are manufactured by Johnsonite. Equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
3. Profile and Dimensions: Provide profiles to fit conditions and as recommended by flooring installer unless indicated otherwise. Profile and width of height required to protect exposed edge of carpet and provide transition to adjacent materials, and of maximum lengths to minimize running joints. Final Selection shall be as approved by the Architect.
4. Locations: Provide at transition between floor types and at edges of floor covering that would otherwise be exposed unless indicated otherwise.
5. Colors and Patterns: As selected by Architect from full range of industry colors.

## 2.6 ENVIRONMENTAL

- A. Floorscore Requirements: The vinyl flooring shall meet testing and product requirements of the Resilient Floor Covering Institute (RFCI) in conjunction with Scientific Certification Systems (SCS).
- B. Adhesives: Adhesives for or site installation or factory fabrication: Submit manufacturer's documentation substantiating the following requirements for each type of materials provided per this specification:
- C. Data: Product data for adhesives as indicated.
- D. Submit manufacturer's certification that products comply with VOC limits when calculated according to 40CFR 59, Subpart D (EPA Method 24).
- E. Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
- F. Submit Green Seal Certification to GS-36 and description of the basis of certification.
- G. Submit manufacturer's certification that products comply with SCAQMD #1168. Submit manufacturer's certification that products comply with SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions do exist or direct exposure to moisture can occur, submit manufacturer's certification that products comply with Bay Area AQMD Reg. 8, Rule 51 for containers larger than 16 oz with California Air Resources Board (CARB) for containers 16 oz or less.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas where installation of flooring will occur, with Installer present. Do not proceed with installation until unsatisfactory conditions have been corrected.

- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F710 and the following:
  - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by tile manufacturer.
  - 2. Finishes of subfloors comply with tolerances and other requirements specified in Division 03 Section "Cast-In-Place Concrete" for slabs receiving resilient flooring.
  - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits of any kind.

### 3.2 PREPARATION

- A. Comply with manufacturer's installation specifications to prepare substrates to receive flooring.
- B. Concrete Substrates: Prepare according to ASTM F 710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.
  - 3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
  - 4. Moisture Testing: Proceed with installation only after substrates pass testing according to resilient sheet flooring manufacturer's written recommendations, but not less stringent than the following:
    - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Use trowelable leveling and patching compounds per manufacturer's directions to fill cracks, holes, and depressions in substrates.
- D. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.
- E. Broom or vacuum clean substrates to be covered by flooring immediately before installation. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.
- F. Apply concrete slab primer, if recommended by flooring manufacturer, before applying adhesive. Apply according to manufacturer's directions.
- G. When installing resilient flooring over fiber reinforced concrete, the fibers will either have to be ground off or level the slab with cementitious underlayment. Exposed reinforcing fibers are considered matter that will adversely affect the appearance of the installed resilient flooring.

### 3.3 INSTALLATION

- A. Comply with manufacturer's installation directions and other requirements indicated that are applicable to each type of installation included in Project.
- B. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width, unless noted otherwise Adjust to avoid using cut widths at perimeter that equal less than one-half of a tile, unless noted otherwise Install tiles square with room axis, unless otherwise indicated.
- C. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.
  - 1. Lay tiles in pattern with respect to location of colors, patterns, and sizes as indicated on drawings.
- D. Scribe, cut, and fit tiles to butt tightly to vertical surfaces, permanent fixtures, built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.
- E. Extend flooring into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent marking device.
- G. Install flooring on covers for telephone and electrical ducts, and similar items occurring within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers. Tightly adhere edges to perimeter of floor around covers and to covers.
- H. Adhere flooring substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed tile installation.
- I. Use full spread of adhesive applied to substrate in compliance with manufacturer's directions including those for trowel notching, adhesive mixing, and adhesive open and working times. Spray applied adhesives are not allowed.
- J. Hand roll flooring where required by manufacturer.
- K. Apply resilient base to walls, columns, pilasters, casework, and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
  - 1. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
  - 2. Install preformed corners before installing straight pieces.
- L. Apply transition accessories at edges of carpeting materials and resilient flooring that would otherwise be exposed.

### 3.4 CLEANING AND PROTECTION

- A. Perform the following operations after completing installation and in coordination with Owners approved maintenance regiment:
  - 1. Allow adhesive to dry for 48 hours after installation.
  - 2. Remove visible adhesive and other surface blemishes using cleaner recommended by manufacturers.
  - 3. Sweep or vacuum floor thoroughly.
  - 4. Do not wash floor until after time period recommended by resilient floor manufacturer.
  - 5. Damp-mop surfaces with neutral detergent solution while machine scrubbing to remove soil marks.
  - 6. Pick up spent solution with mop or wet vacuum as soon as each floor section has been stripped. Do not allow solution to dry. Rinse thoroughly with clear water. Allow floor to dry thoroughly before applying floor finish.
  
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended by manufacturer or if not recommended, use 1/4-inch thick corrugated cardboard, securing to floor surfaces with "3M" tape. Maintain integrity of covered areas until resilient flooring is ready to receive final floor coating/sealer finishes before Substantial Completion.

### 3.5 INDOOR AIR QUALITY

- A. Temporary ventilation: Provide temporary ventilation as specified – Indoor Air Quality (IAQ) Management, and as follows:
  
- B. Ventilate products prior to installation. Remove from packaging and ventilate in a secure, dry, well-ventilated space free from strong contaminant sources and residues. Provide a temperature range of 60 degrees F minimum to 90 degrees F maximum continuously for minimum 72 hours. Do not ventilate within limits of Work unless otherwise approved by Architect.

### 3.6 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
  
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 09 65 19



## SECTION 09 68 13 – TILE CARPETING

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Carpet Tile.
    - b. Carpet Accessories.

#### 1.3 REFERENCES

- A. ASTM D2859 – Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
- B. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM E648 – Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- D. AATCC – American Association of Textile Colorist and Chemists.
- E. Florida Department of Agriculture and Consumer Services, Consumer Products Laboratory: Certified Carpet Products.
- F. NFPA 253 – Test for Critical Radiant Flux of Floor Covering Systems.
- G. FCIB – Flooring Covering Installation Board.
- H. CRI – Carpet and Rug Institute.
- I. FSPMA – Florida School Plant Management Association, Inc.
- J. Floor Covering Installation Contractor's Association.
- K. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation methods.
- B. Shop Drawings: Show the following:
  - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet.
  - 2. Carpet type, color, and dye lot.
  - 3. Type of subfloor.
  - 4. Type of installation and pattern of installation.

5. Pattern type, location, and direction.
  6. Type, color, and location of insets, borders edge, transition, and other accessory strips.
  7. Transition details to other flooring materials.
- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
1. Carpet: Four (4) full-size samples for each type specified.
  2. Exposed Edge Stripping and Accessory: 12-inch long Samples.
- D. Maintenance Data: For carpet to include in maintenance manuals specified in and include the following:
1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
  2. Precautions for cleaning materials and methods that could be detrimental to carpet.
- E. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- F. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATION SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For carpet, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.



1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
- B. Precautions for cleaning materials and methods that could be detrimental to carpet and carpet cushion.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Carpet manufacturer shall have no less than 5 years experience of producing recyclable carpet and shall have published product literature clearly indicating compliance with requirements of this section.
- B. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements and has successfully installed similar products to those required as work of this Project for not less than five (5) years.
  - 1. Additional Installer Qualifications: Carpet manufacturer shall provide written approval to Owner that installer is an approved installer for all carpet materials specified on this project.
  - 2. Employ only experienced Contractors (Installers) skilled in the successful installation of specified materials and assemblies on similar projects for not less than five (5) years.
- C. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Fire-Test-Response Ratings: Where indicated, provide carpet identical to those of assemblies tested for fire response per NFPA 253 by a qualified testing agency.

1.8 MOCK-UPS

- A. Before installing carpet, install mockups for each type of carpet installation required to demonstrate aesthetic effects and qualities of materials and execution. Install mockups to comply with the following requirements, using materials indicated for the completed Work:
- B. Install mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
- C. Notify Architect seven (7) days in advance of dates and times when mockups will be installed.
- D. Demonstrate the proposed range of aesthetic effects and workmanship.
- E. Obtain Architect's approval of mockups before starting work.
- F. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
- G. Remove mockups when directed.

- H. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

#### 1.9 PRE-INSTALLATION MEETING

- A. The Contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
- B. Pre-installation conference shall be conducted at the project site.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI's "CRI Carpet Installation Standard."
- B. Deliver carpet in original mill protective covering with mill register numbers and tags attached.

#### 1.11 PROJECT CONDITIONS

- A. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."
- B. Environmental Limitations: Do not deliver or install carpet until building is enclosed, wet work in spaces is complete and dry, HVAC system is operating, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

#### 1.12 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Carpet: Full-size units equal to 10 percent of amount installed for each type indicated.
  2. Attic stock shall be designated for use only after completion of Project and shall not be used for repair or replacement during warranty period.
  3. Turn over all extra carpet not needed to complete the installation.

#### 1.13 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

- B. Special Carpet Warranty: Written warranty, non-prorated, signed by carpet manufacturer agreeing to replace carpet that does not comply with requirements or that fails within specified warranty period.
1. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse.
  2. Failures include, but are not limited to, more than ten percent (10%) loss of face fiber/yarn loss by weight normal use, edge raveling, runs, loss of tuft bind strength, dimensional stability, excess static discharge, delamination and stain resistance.
  3. Warranty Period: Fifteen (15) years from Date of Substantial Completion.
  4. Static electricity will maintain static below 3.5 kv at 70° and 20% relative humidity.
  5. Handle any adjustments during the warranty period within fifteen (15) days of written notice.
  6. The backing structure will not delaminate from the face structure nor will there be any shrinkage affecting the performance of the face and backing structure for fifteen (15) years.
- C. Installer's Warranty: Contractor (Installer) shall fully guarantee installation against defects in materials, workmanship, seaming, and loss of adhesion for indicated warranty period.
1. During warranty period, Installer shall repair or replace all defective areas as directed and at no cost to the Owner.
  2. Warranty Period: Not less than 1 year from Date of Substantial Completion.

#### 1.14 PERFORMANCE

- A. Carpet shall conform to the following performance characteristics:
1. Smoke Density: ASTM E 662 Less than 450.
  2. Flammability: ASTM E 648 Class 1 (Glued Down).
  3. Static Propensity: AATCC 134 Under 3.5 KV.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
1. Mannington Commercial

#### 2.2 CARPET TILE (CP1, CP2 and CP3)

- A. Basis of Design: "Current-Infinity Modular"
- B. Construction Type: Tufted Pattern Loop.
- C. Face Fiber: Econyl (100% regenerated Type 6 nylon)
- D. Dye Method: Solution.
- E. Gauge: 5/64 inches.
- F. Stitches: 11.8
- G. Pile Density: 6,352
- H. Yarn Weight: 18 oz.
- I. Pile Thickness (ASTM D-418): 0.102 inch.

- J. Primary Backing: 100% Synthetic.
- K. Size: 18 x 36 inches.
- L. Installation Method: Horizontal Brick Ashlar.
- M. Color: See drawings or as selected by the Architect.

### 2.3 CARPET TILE (WM1 and WM2)

- A. Basis of Design: "Inertia-Infinity Modular"
- B. Construction Type: Tufted Pattern Loop.
- C. Face Fiber: Type 6.6 nylon
- D. Dye Method: Solution.
- E. Gauge: 1/12 inches.
- F. Stitches: 10
- G. Pile Density: 7,200.
- H. Yarn Weight: 36 oz.
- I. Pile Thickness (ASTM D-418): 0.185 inch.
- J. Primary Backing: 100% Synthetic.
- K. Size: 18 x 36 inches.
- L. Installation Method: Horizontal Brick Ashlar.
- M. Color: See drawings or as selected by the Architect.

### 2.4 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided by or recommended by carpet manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, antimicrobial agent, non-staining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and that is recommended by carpet manufacturer.
  - 1. VOC Limits: ASTM D5116 Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products for carpet and adhesives.
  - 2. Adhesive: Water-resistant, mildew-resistant, non-staining, pressure-sensitive type to suit products and subfloor conditions indicated; that complies with flammability requirements for installed carpet and recommend by carpet manufacturer for releasable installations.
- C. Releasable pressure sensitive type adhesive – Use the following as recommended by the carpet manufacturer which will allow removal of carpet tile at any time without damage or adherence to carpet:
  - 1. N5000 low VOC (no solvents) carpet tile adhesive.

### 2.5 FLOOR ACCESSORIES

- A. Vinyl Transitions
  - 1. Description: Transitions, reducer, edge strips and adaptors strips as required to accommodate edge conditions and joints between different flooring materials.

2. Basis of Design: "Slim Line Reducer/Edge Strips"
  - a. Manufacturers: The basis of design products are manufactured by Johnsonite. Equal or better performing products of other manufacturers will be considered for acceptance by the Architect.
3. Profile and Dimensions: Provide profiles to fit conditions and as recommended by flooring installer unless indicated otherwise. Profile and width of height required to protect exposed edge of carpet and provide transition to adjacent materials, and of maximum lengths to minimize running joints. Final Selection shall be as approved by the Architect.
4. Locations: Provide at transition between floor types and at edges of floor covering that would otherwise be exposed unless indicated otherwise.
5. Colors and Patterns: As selected by Architect from full range of industry colors.

## 2.6 ENVIRONMENTAL

- A. Floorscore Requirements: The carpet, carpet cushion shall meet testing and product requirements of the Carpet and Rug Institute's Green Label Plus program.
- B. Adhesives: Adhesives shall meet VOC limit of 50 g/l requirements.
- C. Indoor Air Quality: Carpet and adhesive shall be CRI Green Label certified by published class (product type) and certification number.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Verify that substrates and conditions are satisfactory for carpet installation and comply with requirements specified.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F710 and the following:
  1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet manufacturer.
  2. Subfloor finishes comply with requirements specified in Division 03 Section "Cast-in- Place Concrete" for slabs receiving carpet.
  3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and carpet manufacturer's written installation instructions for preparing substrates indicated to receive carpet installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.

- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet manufacturer.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 13, "Carpet Modules (Tiles)."
- B. Installation Method: As recommended in writing by carpet manufacturer, with non-directional units and merge-able dyelots.
- C. Apply carpet adhesives by roller or spray method over entire surface to receive carpet, in accordance with carpet manufacturer's instructions. Allow adhesive to set and/or dry before initiation of carpet installation, per carpet manufacturer's instructions.
- D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.
- E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
  - 1. Where carpeting does not continue beyond a door to another room, extend carpet into door reveals so that carpet stops under door when door is in closed position.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, non-staining marking device.
- G. Install pattern parallel to walls and borders to comply with CRI, "Patterned Carpet Installations" and with carpet manufacturer's written recommendations and as indicated by the Architect.

### 3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet:
  - 1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet manufacturer.
  - 2. Remove yarns that protrude from carpet surface.
  - 3. Vacuum carpet using commercial machine with face-beater element.
- B. Protect installed carpet to comply with CRI 104, Section 15, and "Protection of Indoor Installations."
- C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer and as required by CRI, Protecting Indoor Installations.

3.5 INDOOR AIR QUALITY

- A. Temporary ventilation: Provide temporary ventilation as specified – Indoor Air Quality (IAQ) Management, and as follows:
- B. Ventilate products prior to installation. Remove from packaging and ventilate in a secure, dry, well-ventilated space free from strong contaminant sources and residues. Provide a temperature range of 60 degrees F minimum to 90 degrees F maximum continuously for minimum 72 hours. Do not ventilate within limits of Work unless otherwise approved by Architect.

3.6 WASTE MANAGEMENT

- A. Collect cutoffs and scrap and place in designated areas for recycling.
- B. Coordinate with manufacturer and local recycler for take-back program or recycling. Set aside scrap to be returned to manufacturer for recycling into new product.

END OF SECTION 09 68 13





## SECTION 09 75 23 – SOLID SURFACE WINDOW SILLS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Solid surface window sills.

#### 1.3 REFERENCES

- A. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM C97 – Absorption and Bulk Specific Gravity of Dimension Stone.
- C. ASTM C99 – Modulus of Rupture of Dimension Stone.
- D. ASTM C170 – Compressive Strength of Dimension Stone.
- E. ASTM C531 – Linear Shrinkage and Coefficient of Thermal Expansion of Chemical- Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
- F. ASTM C880 – Flexural Strength of Dimension Stone.
- G. ASTM C1243 – Relative Resistance to Deep Abrasive Wear of Unglazed Ceramic Tile by Rotating Disc.
- H. ASTM D256 – Izod Pendulum Impact Resistance of Plastics.
- I. ANSI Z124.6 – Stain Resistance.
- J. ANSI/N 42.14 – Radiation.
- K. NEMA – American Society for Testing and Materials.
- L. NSF International.
- M. UL – Underwriters Laboratory.
- N. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Submit data for products.
- B. Shop Drawings: Indicate profiles of units, jointing, fastening, edge treatments and related items.
- C. Samples: Submit the following:

1. Submit full range of available colors and aggregates for selection purposes for Architect's selection. After initial selection, two sets, minimum 4" x 4" for each finished material for acceptance before proceeding with Work.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than five (5) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than two (2) years experience.

#### 1.6 MOCK-UPS

- A. Construct one mock-up of typical window sill shown on Drawings. Approved mock-up can remain as completed work.

#### 1.7 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of construction to receive stone countertops by field measurements before fabrication.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

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

#### 1.9 WARRANTY

- A. Provide manufacturer's warranty against defects in materials.
  1. Warranty shall provide material and labor to repair or replace defective materials.
  2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.
- B. Manufacturer's warranty period:
  1. Ten (10) years from date of substantial completion.

## 1.10 PERFORMANCE

- A. Fire test response characteristics: Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Flame Spread Index: 25 or less.
  2. Smoke Developed Index: 450 or less.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
1. Corian by Dupont Company

### 2.2 MATERIAL

- A. Solid polymer components
1. Cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.
  2. Superficial damage to a depth of 0.010 inch shall be repairable by sanding and/or polishing.
  3. Thickness: 3/4 inch
  4. Edge treatment: As selected by Architect.
  5. Corner Treatment: 1/2" radius

### 2.3 ACCESSORIES

- A. Joint adhesive: Manufacturer's standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.
- B. Installation Adhesive: Provide epoxy or polyester adhesive of type recommend by manufacturer for application and conditions of use.
- C. Solvent: Product recommended by adhesive manufacturer to clean surface of surfacing to assure adhesion of adhesives and sealants.
- D. Cleaning Agents: Non-abrasive, low pH cleansers.

### 2.4 FACTORY FABRICATION

- A. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.

- B. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.
- C. Rout and finish component edges with clean, sharp returns.
  - 1. Rout cutouts, radii and contours to template.
  - 2. Smooth edges.
  - 3. Repair or reject defective and inaccurate work.
- D. Allowable Fabrication Tolerances: Variation in component size  $\pm 1/8"$  over a ten (10) foot length.

## 2.5 FINISHES

- A. Select from the manufacturer's full range of color chart.
  - 1. Color: To be selected by Architect from standard color chart.
- B. Finish:
  - 1. Provide surfaces with a uniform finish.
    - a. Semi-gloss; gloss range of 20–50.
    - b. Verify with Architect.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Inspect material for defects prior to installation.
- B. Color match materials used throughout the project shall be from the same batch and bear labels with the same batch numbers.
  - 1. Visually inspect materials to be used for adjacent pieces to ensure acceptable color match.

### 3.3 INSTALLATION

- A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
- B. Allowable Installation Tolerances
  - 1. Flat and true to within  $1/8"$  of a flat surface over width of window.

2. Install tight to window frame.
3. Allow a minimum of 1/16" to a maximum of 1/8" clearance between surface and each wall.

- C. Provide product in the largest pieces available.
- D. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
  1. Exposed joints/seams shall not be allowed.
- E. Cut and finish component edges with clean, sharp returns.
- F. Anchor securely to support studs with adhesive.
- G. Carefully dress joints smooth, remove surface scratches and clean entire surface.

#### 3.4 REPAIR

- A. Repair or replace damaged work which cannot be repaired to Architect's satisfaction.

#### 3.5 CLEANING AND PROTECTION

- A. Keep components clean during installation.
- B. Remove adhesives, sealants and other stains.
- C. Protect installed sills with cover to protect them from dust/debris throughout duration of construction until final cleaning.

END OF SECTION 09 75 23



## SECTION 09 84 33 – SOUND ABSORBING WALL UNITS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Acoustical wall panels.

#### 1.3 REFERENCES

- A. ASTM C423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- B. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM E90 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- D. UL 723 – Tests for Surface Burning Characteristics of Building Materials.
- E. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of fabric facing, panel edge, core material, and mounting indicated.
- B. Shop Drawings: Include elevations, panel sizes, direction of fabric weave, pattern matching, mounting devices and details; details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge and core materials.
- C. Samples: For the following products, prepared on Samples of size indicated below:
  - 1. Fabric: Full-width by approximately 24-inch long Sample, but not smaller than required to show complete pattern repeat, from dye lot to be used for the Work, and with specified treatments applied. Mark top and face of fabric.
  - 2. Panel Edge: 12-inch long Sample(s) showing each edge profile, corner, and finish.
  - 3. Core Material: 12-inch square Sample at corner.
  - 4. Mounting Devices: Full-size Samples.
  - 5. Assembled Panels: Approximately 24 by 24 inches, including joints and mounting methods.

D. Environmental:

1. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
2. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - a. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - b. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - d. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.
3. Certification: Submit manufacturer's documentation substantiating the requirements for each type of materials as indicated per specification section as certifications and other indicated documentation.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  1. Electrical outlets, switches, and thermostats.
  2. Items penetrating or covered by fabric-wrapped wall panels including, lighting fixtures, switches and miscellaneous devices.
  3. Show operation of hinged and sliding components covered by or adjacent to fabric-wrapped wall panels.
- B. Product Certificates: For each type of fabric-wrapped wall panel from manufacturer.
- C. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For fabric-wrapped wall panels to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal recommendations.



1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials from same production run that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Fabric: For each fabric, color, and pattern installed, provide length equal to 10 percent of amount installed, but no fewer than 10 yards.
  - 2. Mounting Devices: Full-size units equal to 5 percent of amount installed, but no fewer than five devices, including unopened adhesives.

1.8 QUALITY ASSURANCE

- A. Source Limitations: Obtain fabric-wrapped wall panels from single source from single manufacturer.
- B. Fire-Test-Response Characteristics: Provide fabric-wrapped wall panels meeting the following as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. Surface-Burning Characteristics: As determined by testing per ASTM E 84.
    - a. Flame-Spread Index: 25 or less.
    - b. Smoke-Developed Index: 450 or less.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with fabric and fabric-wrapped, wall panel manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
- B. Deliver materials and panels in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.10 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fabric-wrapped wall panels until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Air-Quality Limitations: Protect fabric-wrapped wall panels from exposure to airborne odors such as tobacco smoke, and install panels under conditions free from odor contamination of ambient air.
- C. Field Measurements: Verify locations of fabric-wrapped wall panels and actual dimensions of openings and penetrations by field measurements before fabrication.

## 1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fabric-wrapped wall panels that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Fabric sagging, distorting, or releasing from panel edge.
    - b. Warping of core.
  - 2. Warranty Period: Two (2) years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer shall be one of the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Armstrong World Industries
  - 2. Tectum, Inc.
  - 3. Rockfon Systems
  - 4. Acoustimac

### 2.2 FABRIC-WRAPPED WALL PANELS (PF1, PF2 and PF3)

- A. Fabric-Wrapped Acoustical Wall Panel: Manufacturer's standard panel construction consisting of facing material stretched over front face of edge-framed core and bonded or attached to edges and back of frame.
  - 1. Provide 2" thick panels with fiberglass core material (6 PCF) and minimum NRC of 0.80 per inch.
  - 2. Size: As indicated on drawings.
  - 3. Panels shall have square edges and corners and be furnished with continuous chemically hardened internal edge protection.
  - 4. Provide fabric covering the face, all edges, and a return on the back of a minimum of 1½".
  - 5. All components utilized in the construction of these wall panels shall meet Class A (0-25) rating per ASTM E84, fuel contribution of 20, and smoke density value of 65.
  - 6. Fabric: "Meteor" as manufactured by Carnegie.
  - 7. All fabric shall be treated with manufacturer's standard anti-microbial treatment.
  - 8. Color: See drawings for selection or as selected by the Architect.
  - 9. Mounting Z-clips.

### 2.3 FABRICATION

- A. General: Use manufacturer's standard construction except as otherwise indicated; with facing material applied to face, edges, and back border of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.

- B. Mineral-Fiber Board Cores: Chemically harden core edges and areas of core where mounting devices are attached.
- C. Core-Face Layer: Evenly stretched over core face and edges and securely attached to core; free from puckers, ripples, wrinkles, or sags.
- D. Facing Material: Apply fabric fully covering visible surfaces of panel; with material stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other visible distortions or foreign matter.
  - 1. Square Corners: Tailor corners.
  - 2. Fabrics with Directional or Repeating Patterns or Directional Weave: Mark fabric top and attach fabric in same direction so pattern or weave matches in adjacent panels.
- E. Dimensional Tolerances of Finished Panels: Plus or minus 1/16 inch for the following:
  - 1. Thickness.
  - 2. Edge straightness.
  - 3. Overall length and width.
  - 4. Squareness from corner to corner.
  - 5. Chords, radii, and diameters.
- F. Environmental:
  - 1. Adhesives for or site installation or factory fabrication: Submit manufacturer's documentation substantiating the following requirements for each type of materials provided per this specification:
    - a. Product data for adhesives as indicated.
    - b. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
    - c. Submit manufacturer's certification that products comply with VOC limits when calculated according to 40CFR 59, Subpart D (EPA Method 24).
    - d. Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
    - e. Submit Green Seal Certification to GS-36 and description of the basis of certification.
    - f. Submit manufacturer's certification that products comply with SCAQMD #1168. Submit manufacturer's certification that products comply with SCAQMD Rule 1168 in areas where exposure to freeze/thaw conditions and direct exposure to moisture will not occur. In areas where freeze/thaw conditions do exist or direct exposure to moisture can occur, submit manufacturer's certification that products comply with Bay Area AQMD Reg. 8, Rule 51 for containers larger than 16 oz with California Air Resources Board (CARB) for containers 16 oz or less.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine fabric, fabricated panels, substrates, areas, and conditions, for compliance with requirements, installation tolerances, and other conditions affecting performance of fabric-wrapped wall panels.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install fabric-wrapped wall panels in locations indicated with vertical surfaces and edges plumb, top edges level and in alignment with other panels, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.
- B. Comply with fabric-wrapped, wall panel manufacturer's written instructions for installation of panels using type of mounting devices indicated. Mount panels securely to supporting substrate.
- C. Align and level fabric pattern and grain among adjacent panels.

3.3 INSTALLATION TOLERANCES

- A. Variation from Plumb and Level: Plus or minus 1/16 inch.
- B. Variation of Panel Joints from Hairline: Not more than 1/16 inch wide.

3.4 CLEANING

- A. Clip loose threads; remove pills and extraneous materials.
- B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION 09 84 33

## SECTION 09 91 13 – EXTERIOR PAINTING

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Exterior paint and coating systems.

#### 1.3 REFERENCES

- A. ASTM D16 – Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. ASTM D3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
- C. ASTM D4442-92 – Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood Base Materials.
- D. EPA – Method 24.
- E. GS-11, GC-03.
- F. NACE International (National Association of Corrosion Engineers) – Industrial Maintenance Painting.
- G. NPCA (National Paint and Coatings Association) – Guide to U.S. Government Paint Specifications.
- H. Paint – Certified Product List - Florida Department of Agriculture and Consumer Services.
- I. PDCA (Painting and Decorating Contractors of America) – Architectural Painting Specifications Manual.
- J. PDCA Standard P1-04 Touchup Painting and Damage Repair; Financial Responsibility.
- K. PDCA Standard P5-04 Benchmark Sample Procedures for Paint and other Decorative Coating System.
- L. SSPC (Steel Structures Painting Council) – Steel Structures Painting Manual.
- M. SSPC-SP 1 – Solvent Cleaning.
- N. Modern Guide to Paint Specifications (current edition) – Standard Type 1.

#### 1.4 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product:

1. Product characteristics
2. Surface preparation instructions and recommendations
3. Primer requirements and finish specifications
4. Storage and handling requirements
5. Application methods
6. Cautions and VOC levels, certification from manufacturer that products comply with local regulations controlling volatile organic compounds (VOC's).
7. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
8. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

B. Samples:

1. Submit a complete set of color chips representing the full range of manufacturer's color samples available.
2. Submit two 9" x 9" samples illustrating selected colors and textures for each type.

1.6 INFORMATION SUBMITTALS

A. Closeout Documents:

1. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as "Custodian Project Color and Product Information" by Sherwin-Williams or equal. Manual shall include an Area Summary with finish schedule designating where each product/color/finish was used. It shall also include care and Cleaning instructions, touch up procedures, and a Product Data Sheet for each product used.

1.7 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 5-years documented experience.
- B. Applicator: Company specializing in performing the work of this section with minimum 5-years documented experience.
- C. Existing Coatings: The manufacturer's representation shall visit the site to confirm acceptability of existing surfaces to receive paint and make recommendations to specified paint systems to obtain proper compatibility.

1.8 MOCKUPS

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

- B. Architect will select one surface to represent surfaces and conditions for application of each paint system.
  - 1. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. and at exterior inside and outside corner.
  - 2. Other Items: Architect will designate items or areas required.
- C. Final approval of color selections will be based on mockups.
  - 1. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
- D. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- E. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.9 PRE-INSTALLATION MEETING

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
- B. The paint manufacturer's representative shall review the painting systems with the Construction manager, Contractor, Architect and painting Contractor.

#### 1.10 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke rating requirements for finishes.
- B. Painting manufacturer and Contractor shall conform to Federal Rules and Regulations, Vol. 63, No. 176, September 11, 1998, State and local VOC (Volatile Organic Compound) Regulations in area where Project is located. Notify Architect in writing if variations to Specifications herein are required.
  - 1. VOC content shall be a maximum 350 gm/liter, unless noted otherwise.
- C. VOC Content: Determine VOC (Volatile Organic Compound) content of solvent borne and waterborne paints and related coatings in accordance with EPA Method 24 or ASTM D3960.

#### 1.11 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

B. Storage:

1. Store paint materials in a properly ventilated area at the temperature range required by the manufacturer.
2. Store and dispose of solvent-based materials and materials used with solvent-based materials in accordance with manufacturer's and other regulating authorities having jurisdiction.

1.12 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.13 MAINTENANCE MATERIAL

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.14 WARRANTY

- A. Contractor shall provide five (5) year warranty against defects in labor and installation of paint materials in the form indicated at the end of this section.
- B. Manufacturer shall provide five (5) year warranty against defects in all paint products and materials incorporated into the work.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers
  1. The painting schedule is based on products manufactured by the Sherwin-Williams Company, and MasterProtect (BASF).
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Sherwin Williams
  2. Benjamin Moore & Co.
  3. Florida Paint
  4. MasterProtect (BASF)



## 2.2 COMPATIBILITY

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists.
- B. Paint materials and equipment shall be compatible in use; finish coats shall be compatible with prime coats; prime coats shall be compatible with the surface to be coated; tools and equipment shall be compatible with the coating to be applied.
  - 1. Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristic of finish materials to ensure use of compatible primers.
  - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Adhesion Test: Provide adhesion X-cut and tape test for primer adhesion per ASTM D3359 for every 200 s.f. of primed area.
- D. Thinners, when used, shall be only those thinners recommended for that purpose by the manufacturer of the material to be thinned.
- E. The term "paint," as used herein, includes enamels, paints, sealers, stains, fillers, emulsions, and other coatings, whether used as prime, intermediate, or finish coats.

## 2.3 ACCEPTANCE OF SPECIFICATION

- A. By submitting a proposal, the Contractor has reviewed the bidding documents with the painting subcontractor and accepts the Specifications as sufficient to produce approved painting results. If the painting subcontractor contends that the materials or number of coats specified will not produce satisfactory results, he shall so notify the Architect directly or indirectly through a Bidding Contractor 14 days prior to receipt of bids for proper action.
- B. The type of material to be used and the number of coats to be applied are listed in the "Painting Schedule" of this section of these specifications. Also refer to Room Finish Schedule.
  - 1. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
  - 2. The Architect shall not be limited in the number of colors selected for single space or for the complete Project.
  - 3. The architect shall make the final selection of the finish sheen.

## 2.4 PAINTING SCHEDULE

- A. Concrete (Cast-In Place, Precast Concrete)
  - 1. Acrylic Systems
    - a. Finish
      - 1st Coat: MasterProtect (BASF) P100 Primer (300 – 375 sq. ft./gal.)
      - 2nd Coat: MasterProtect (BASF) HB 200 Water Based Acrylic (5.0 – 8.0 mils dry)

3rd Coat: MasterProtect (BASF) HB 200 Water Based Acrylic (5.0 – 8.0 mils dry)  
4th Coat: MasterProtect (BASF) C 350 Waterproof Coating Acrylic (2.0 – 3.3 mils dry)

B. Cement Plaster and Cementitious Siding

1. Latex Systems

a. Finish

1st Coat: MasterProtect (BASF) P100 Primer (300 – 375 sq. ft./gal.)  
2nd Coat: MasterProtect (BASF) HB 200 Water Based Acrylic (5.0 – 8.0 mils dry)  
3rd Coat: MasterProtect (BASF) HB 200 Water Based Acrylic (5.0 – 8.0 mils dry)  
4th Coat: MasterProtect (BASF) C 350 Waterproof Coating Acrylic (2.0 – 3.3 mils dry)

C. Masonry (CMU, Split-Face, Scored, Smooth, High-Density, Low-Density, Fluted)

1. Latex Systems

a. Finish

1st Coat: MasterProtect (BASF) P100 Primer (300 – 375 sq. ft./gal.)  
2nd Coat: MasterProtect (BASF) HB 200 Water Based Acrylic (5.0 – 8.0 mils dry)  
3rd Coat: MasterProtect (BASF) HB 200 Water Based Acrylic (5.0 – 8.0 mils dry)  
4th Coat: MasterProtect (BASF) C 350 Waterproof Coating Acrylic (2.0 – 3.3 mils dry)

2. Latex Systems

a. Gloss Finish

1st Coat: S-W Pro Industrial Pro-Cryl® Universal Primer, B66W1300 Series (5.0 - 10.0-mil dry) – MPI#107  
2nd Coat: S-W Pro Industrial DTM Acrylic Gloss Coating, B66W1050 Series – MPI#114  
3rd Coat: S-W Pro Industrial DTM Acrylic Gloss Coating, B66W1050 Series (2.5 - 4.0-mil dry per coat)

b. Semi-Gloss Finish

1st Coat: S-W Pro Industrial Pro-Cryl® Universal Primer, B66W1300 Series (5.0 - 10.0-mil dry) – MPI#107  
2nd Coat: S-W Pro Industrial DTM Acrylic Semi-Gloss Coating, B66W1150 Series – MPI#114  
3rd Coat: S-W Pro Industrial DTM Acrylic Semi-Gloss Coating, B66W1150 Series (2.5 - 4.0-mil dry per coat)

D. Metal – (Misc. Iron, Ornamental Iron, Structural Iron, Ferrous Metal)

1. Latex Systems

a. Gloss Finish

1st Coat: S-W Pro Industrial Pro-Cryl® Universal Primer, B66W1300 Series (2.0 - 4.0-mil dry) – MPI#107  
2nd Coat: S-W Pro Industrial DTM Acrylic Gloss Coating, B66W1050 Series – MPI#114  
3rd Coat: S-W Pro Industrial DTM Acrylic Gloss Coating, B66W1050 Series – (2.5 - 4.0-mil dry per coat)

b. Semi-Gloss Finish

1st Coat: S-W Pro Industrial Pro-Cryl® Universal Primer, B66W1300 Series (2.0 - 4.0-mil dry) – MPI#107  
2nd Coat: S-W Pro Industrial DTM Acrylic Semi-Gloss Coating, B66W1150 Series – MPI#114

3rd Coat: S-W Pro Industrial DTM Acrylic Semi-Gloss Coating, B66W1150 Series  
(2.5 - 4.0-mil dry per coat)

E. Architectural PVC, Plastic, Fiberglass

1. Latex Systems

a. Gloss Finish

1st Coat: S-W Multi-Purpose Latex Primer/Sealer, B51-450 Series (1.4-mil dry) –  
MPI#17

2nd Coat: S-W A-100 Exterior Latex Gloss, A8W150 Series – MPI#11

3rd Coat: S-W A-100 Exterior Latex Gloss, A8W150 Series (1.3-mil dry per coat)

b. Semi-Gloss Finish

1st Coat: S-W Multipurpose Latex Primer/Sealer, B51-450 Series (1.4-mil dry) –  
MPI#17

2nd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W1150 Series –  
MPI#153

3rd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W1150 Series (2.5-4.0-  
mil dry per coat)

F. Drywall (Gypsum Board, Exterior Drywall)

1. Latex Systems

a. Gloss Finish

1st Coat: S-W Multipurpose Latex Primer/Sealer, B51-450 Series (1.4-mil dry) –  
MPI#17

2nd Coat: S-W A-100 Exterior Latex Gloss, A8W150 Series – MPI#11

3rd Coat: S-W A-100 Exterior Latex Gloss, A8W150 Series (1.3-mil dry per coat)

b. Semi-Gloss Finish

1st Coat: S-W Multipurpose Latex Primer/Sealer, B51-450 Series (1.4-mil dry) –  
MPI#17

2nd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W1150 Series –  
MPI#153

3rd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66W1150 Series (2.5-4.0-  
mil dry per coat)

2.5 MATERIALS – GENERAL REQUIREMENTS

A. Paints and Coatings – General

1. Unless otherwise indicated, provide factory-mixed coatings.
2. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application.
3. Do not reduce, thin, or dilute coatings or add materials to coatings unless approved in manufacturer's product instructions.
4. Confirm VOC's need by using the products MSDS sheets.

- B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

## 2.6 ACCESSORIES

- A. Coating application accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.
- B. Patch Material: Patching compound for concrete, cement plaster and masonry units.
  - 1. "MasterProtect FL 746 as manufactured by BASF.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows (Do not apply finishes unless moisture content of surfaces are below the following maximums):
  - 1. Concrete: 12 percent
  - 2. Fiber-Cement Board: 12 percent
  - 3. Masonry (Clay and CMUs): 12 percent
  - 4. Gypsum Board: 12 percent
  - 5. Plaster: 12 percent
- C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.
- E. Do not begin application of coatings until substrates have been properly prepared; notify Owner's Representative of unsatisfactory conditions before proceeding.
- F. If substrate preparation is the responsibility of another installer, notify Owner's Representative of unsatisfactory preparation before proceeding.
- G. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.
- H. Test shop applied primer for compatibility with subsequent cover materials.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

- B. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- C. The surface shall be dry and in sound condition. Remove all oil, dust, dirt, loose rust, peeling paint, or other contamination to ensure good adhesion.
- D. Provide barrier coats over incompatible primers or remove and re-prime. Notify Architect in writing about anticipated problems using the specified finish coat material with substrates primed by others.
- E. Impervious Surfaces:
  - 1. Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach.
  - 2. Rinse with clean water and allow surface to dry.
- F. Aluminum Surfaces:
  - 1. Remove all oil, grease, dirt, oxide, and other foreign material by cleaning per SSPC-SP1 Solvent Cleaning.
- G. Block/Unit Masonry (Cinder and Concrete)
  - 1. Remove all loose mortar and foreign material.
  - 2. Patch voids and cracks with patching compound.
  - 3. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners.
  - 4. Let concrete and mortar cure at least 30 days at 75°F unless the manufactures products are designed for application prior to the 30-day period.
  - 5. The pH of the surface and moisture content must be in accordance with the paint manufacturer's recommendations prior to painting.
- H. Concrete:
  - 1. Remove contamination by washing with an appropriate cleaner, rinse thoroughly.
  - 2. Patch voids and cracks with patching compound.
  - 3. The pH of the surface and moisture content shall be in accordance with the paint manufacturer's recommendations prior to painting.
  - 4. Allow the surface to thoroughly dry.
  - 5. Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid or other etching cleaner. Flush floor with clean water to neutralize acid and allow to dry before painting.
  - 6. Fill bug holes, air pockets, and other voids under another section with a cement-patching compound of sufficient cohesive strength to support the specified coating system.
- I. Drywall:
  - 1. Shall be clean, dry and all dust removed prior to painting.
  - 2. All nail heads must be set and spackled.
  - 3. Tape all joints and cover with a joint compound.
  - 4. Spackled nail heads and tape joints shall be sanded smooth.

J. Galvanized Surfaces:

1. Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils.
2. Apply a test area, priming as required.
3. Allow the coating to cure in accordance with the manufacturer's recommendation before testing.
4. Perform adhesion tests in accordance with ASTM 3359 Adhesion by Tape Test.
5. If adhesion is poor, then notify Owner's representative that additional surface preparation under another section is necessary to remove pre-treatments or contaminants that interfere with adhesion of the coating.

K. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.

L. Plaster Cement Surfaces:

1. Shall allow to thoroughly dry for at least 30 days before painting, unless the manufacturer's products are designed for application prior to the 30-day period.
2. Patch voids and cracks with patching compound.
3. Bare plaster must be cured and hard prior to painting.
4. Correct any soft, porous, or powdery plaster per requirements under another section of the specifications.

M. Steel: Structural, Plate, etc.:

1. Check other sections for additional surface preparation and shop priming of bare steel surfaces.
2. Surface preparation shall include appropriate SSPC recommended methods.
  - a. Shop primer shall be compatible with the field-applied coatings.
  - b. Surfaces shall be dry and clean prior to the application of field-applied coatings.
  - c. Remove all contaminants in accordance with SSPC-SP1 Solvent Cleaning or SSPC Method recommended for condition of substrate.

### 3.3 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue
- C. Stir materials before application to produce a mixture of uniform density and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using
- D. Use only thinners approved by the paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat of lighter shade to facilitate identification of each coat where multiple coats of the same materials are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

- F. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming surface treatment specified under other sections.
- G. Preparation and testing of existing painted surfaces, indicated to be repainted to accommodate new work, shall be performed as work of this section.

### 3.4 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
- B. Use applicators and techniques suited for paint and substrate indicated
  - 1. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
  - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  - 3. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
  - 4. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but provide sufficient difference in shade of undercoats to distinguish each separate coat.
  - 5. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
  - 6. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
  - 7. Apply paint in a cross-hatch application to achieve an even coverage.

### 3.5 FIELD QUALITY CONTROL

- A. The right is reserved by Owner/Architect to invoke the following material testing procedure in addition to other tests indicated when and as often as he deems necessary during the period of field painting.
- B. Engage services of an independent testing laboratory to sample paint being used. Samples of materials delivered to project site will be taken, identified and sealed, and certified in presence of Contractor.
- C. Testing laboratory will perform appropriate tests for one or each of the following characteristics: Abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance, and quantitative materials analysis.
- D. A test patch for applied paint adhesion may be required.
  - 1. Adhesion test shall provide the adhesion X-cut and tape test for adhesion per ASTM D3359 for areas selected by the Architect.
  - 2. Areas found to be defective shall have paint removed and repainting shall be provided.
  - 3. Owner/Architect may require retesting.

- E. A test patch for adhesion may also be required. The procedure for the test patch is as follows:
1. An area that represents the worst condition of the existing paint is selected.
  2. The surface is prepared as appropriate for the repaint work.
  3. The new coating or coating system is applied.
  4. The coating is allowed to cure for at least 7 days at 75 degrees F. or according to the coating manufacturer's instructions.
  5. After proper curing the adhesion is tested using an acceptable method such as the Adhesion by Tape Test (ASTM D 3359).
- F. If test results show that material being used does not comply with specified requirements, Contractor may be directed to stop painting work, and remove noncomplying paint; pay for testing; repaint surfaces coated with rejected paint; remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the 2 coatings are noncompatible.

### 3.6 EQUIPMENT

- A. Paint the following work where exposed.
1. Uninsulated metal and plastic piping.
  2. Pipe hangers and supports.
  3. Metal and plastic conduit.

### 3.7 CLEAN-UP AND PROTECTION

- A. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- B. Provide "Wet Paint" signs as required to protect newly painted finishes.
- C. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- D. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- E. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- F. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### 3.8 TOUCH-UP AND DAMAGE REPAIR

- A. Contractor shall repair all deficiencies in coating application in accordance with PDCA Standard P1-04.
- B. Inform Owner's representative of all damage to properly painted surfaces and receive authorization prior to performing damage repair.



3.9 SITE ENVIRONMENTAL PROCEDURES

- A. Indoor Air Quality: Provide temporary ventilation as specified in specification section – “Temporary Facilities and Controls.”
- B. Waste Management: As specified in specification section – “Temporary Facilities and Controls” and as follows:
  - 1. Coordinate with manufacturer for take-back program. Set aside scrap to be returned to manufacturer for recycling into new product. Close and seal all partially used containers of paint to maintain quality as necessary for reuse.

END OF SECTION 09 91 13



## SECTION 09 91 23 – INTERIOR PAINTING

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SECTION INCLUDES

- A. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - 1. Interior paint and coating systems.

#### 1.3 REFERENCES

- A. ASTM D16 – Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. ASTM D3359 – Standard Test Methods for Measuring Adhesion by Tape Test.
- C. ASTM D4442-92 – Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood Base Materials.
- D. EPA – Method 24.
- E. GS-11, GC-03.
- F. NACE International (National Association of Corrosion Engineers) – Industrial Maintenance Painting.
- G. NPCA (National Paint and Coatings Association) – Guide to U.S. Government Paint Specifications.
- H. Paint – Certified Product List - Florida Department of Agriculture and Consumer Services.
- I. PDCA (Painting and Decorating Contractors of America) – Architectural Painting Specifications Manual.
- J. PDCA Standard P1-04 Touchup Painting and Damage Repair; Financial Responsibility.
- K. PDCA Standard P5-04 Benchmark Sample Procedures for Paint and other Decorative Coating System.
- L. SSPC (Steel Structures Painting Council) – Steel Structures Painting Manual.
- M. SSPC-SP 1 – Solvent Cleaning.
- N. Modern Guide to Paint Specifications (current edition) – Standard Type 1.

#### 1.4 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

#### 1.5 ACTION SUBMITTALS

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

1. Product characteristics
2. Surface preparation instructions and recommendations
3. Primer requirements and finish specifications
4. Storage and handling requirements
5. Application methods
6. Cautions and VOC levels, certification from manufacturer that products comply with local regulations controlling volatile organic compounds (VOC's).
7. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
8. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

B. Samples:

1. Submit a complete set of color chips representing the full range of manufacturer's color samples available.
2. Submit two 9" x 9" samples illustrating selected colors and textures for each type.

1.6 INFORMATION SUBMITTALS

A. Closeout Documents:

1. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as "Custodian Project Color and Product Information" by Sherwin-Williams or equal. Manual shall include an Area Summary with finish schedule designating where each product/color/finish was used. It shall also include care and Cleaning instructions, touch up procedures, and a Product Data Sheet for each product used.

1.7 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 5-years documented experience.
- B. Applicator: Company specializing in performing the work of this section with minimum 5-years documented experience.
- C. Existing Coatings: The manufacturer's representation shall visit the site to confirm acceptability of existing surfaces to receive paint and make recommendations to specified paint systems to obtain proper compatibility.

1.8 MOCKUPS

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
- B. Architect will select one surface to represent surfaces and conditions for application of each paint system.

1. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. and at exterior inside and outside corner.
  2. Other Items: Architect will designate items or areas required.
- C. Final approval of color selections will be based on mockups.
1. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
- D. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- E. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.9 PRE-INSTALLATION MEETING

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.
- B. The paint manufacturer's representative shall review the painting systems with the Construction Manager, Architect and painting Contractor.

#### 1.10 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke rating requirements for finishes.
- B. Painting manufacturer and Contractor shall conform to Federal Rules and Regulations, Vol. 63, No. 176, September 11, 1998, State and local VOC (Volatile Organic Compound) Regulations in area where Project is located. Notify Architect in writing if variations to Specifications herein are required.
  1. VOC content shall be a maximum 350 gm/liter, unless noted otherwise.
- C. VOC Content: Determine VOC (Volatile Organic Compound) content of solvent borne and waterborne paints and related coatings in accordance with EPA Method 24 or ASTM D3960.

#### 1.11 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.
- B. Storage:
  1. Store paint materials in a properly ventilated area at the temperature range required by the manufacturer.

2. Store and dispose of solvent-based materials and materials used with solvent-based materials in accordance with manufacturer's and other regulating authorities having jurisdiction.

#### 1.12 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Provide lighting level of 80 foot-candles measured mid-height at substrate surface.

#### 1.13 MAINTENANCE MATERIAL

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

#### 1.14 WARRANTY

- A. Contractor shall provide five (5) year warranty against defects in labor and installation of paint materials in the form indicated at the end of this section.
- B. Manufacturer shall provide five (5) year warranty against defects in all paint products and materials incorporated into the work.

### PART 2 – PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers
  1. The painting schedule is based on products manufactured by the Sherwin-Williams Company.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Sherwin-Williams Company
  2. Benjamin Moore & Co.
  3. Florida Paint

#### 2.2 COMPATIBILITY

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."

- B. Paint materials and equipment shall be compatible in use; finish coats shall be compatible with prime coats; prime coats shall be compatible with the surface to be coated; tools and equipment shall be compatible with the coating to be applied.
  - 1. Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristic of finish materials to ensure use of compatible primers.
  - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Adhesion Test: Provide adhesion X-cut and tape test for primer adhesion per ASTM D3359 for every 200 s.f. of primed area.
- D. Thinners, when used, shall be only those thinners recommended for that purpose by the manufacturer of the material to be thinned.
- E. The term "paint," as used herein, includes enamels, paints, sealers, stains, fillers, emulsions, and other coatings, whether used as prime, intermediate, or finish coats.

### 2.3 ACCEPTANCE OF SPECIFICATION

- A. By submitting a proposal, the Contractor has reviewed the bidding documents with the painting subcontractor and accepts the Specifications as sufficient to produce approved painting results. If the painting subcontractor contends that the materials or number of coats specified will not produce satisfactory results, he shall so notify the Architect directly or indirectly through a Bidding Contractor 14 days prior to receipt of bids for proper action.
- B. The type of material to be used and the number of coats to be applied are listed in the "Painting Schedule" of this section of these specifications. Also refer to Room Finish Schedule.
  - 1. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
  - 2. The Architect shall not be limited in the number of colors selected for single space or for the complete Project.
  - 3. The Architect shall make the final selection of the finish sheen.

### 2.4 PAINTING SCHEDULE

- A. Concrete (Walls, Ceilings, Poured, Precast, Cement Plaster, Cement Board, and Cast-In Place)
  - 1. Latex Systems
    - a. Eggshell/Satin Finish
      - 1st Coat: S-W Loxon Concrete & Masonry Primer Sealer, LX02W50 (8-mil wet, 3.2-dry) – MPI #3S-W Pro Industrial Heavy Duty Block Filler, B42W150 at 75-100 sq/gallon
      - 2nd Coat: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series – MPI #144 X-Green
      - 3rd Coat: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series (1.6-mil dry per coat)

- b. Flat Finish – Ceilings Only
    - 1st Coat: S-W Loxon Concrete & Masonry Primer Sealer, LX02W50 (8-mil wet, 3.2-dry)
    - 2nd Coat: S-W Harmony Low Odor Interior Latex Flat, B5 Series
    - 3rd Coat: S-W Harmony Low Odor Interior Latex Flat, B5 Series (4-mil wet, 1.6-mil dry per coat)
  - 2. Epoxy System (Water Base)
    - a. Eggshell/Satin Finish
      - 1st Coat: S-W Pro Industrial Water Based Catalyzed Epoxy Eg-Shel, B73-360 / B73V300 – MPI #254X-Green
      - 2nd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy Eg-Shel, B73-360 / B73V300 - (2.0 – 4.0-mil dry per coat)
- B. Masonry (CMU, Split-Face, Scored, Smooth, High-Density, Low-Density, Fluted)
- 1. Latex Systems
    - a. Eggshell/Satin Finish
      - 1st Coat: S-W Pro Industrial Heavy-Duty Block Filler, B42W150 at 75-100 sq/gallon – MPI#4
      - 2nd Coat: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series – MPI #144 X-Green
      - 3rd Coat: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series (1.6-mil dry per coat)
    - 2. Water Epoxy System (Water Base)
      - a. Eg-Shel Finish
        - 1st Coat: S-W Pro Industrial Heavy-Duty Block Filler, B42W150 at 75-100 sq/gallon – MPI#4
        - 2st Coat: S-W Pro Industrial Water Based Catalyzed Epoxy Eg-Shel, B73-360 / B73V300 – MPI #254X-Green
        - 3rd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy Eg-Shel, B73-360 / B73V300 (2.0 – 4.0-mil dry per coat)
- C. Metal – (Aluminum, Galvanized)
- 1. Latex Systems
    - a. Semi-Gloss Finish
      - 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Primer, B66W1300 Series (2.0 – 4.0-mil dry per coat) – MPI #107
      - 2nd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series – MPI #153
      - 3rd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series (2.5 - 4.0-mil dry per coat)
    - b. Eg-Shel/Satin Finish
      - 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Primer, B66W1300 Series (2.0 – 4.0-mil dry) – MPI#107
      - 2nd Coat: S-W Pro Industrial DTM Acrylic Eg-Shel Coating, B66W1250 Series – MPI #151X-Green
      - 3rd Coat: S-W Pro Industrial DTM Acrylic Eg-Shel Coating, B66W1250 Serie (2.5 - 4.0-mil dry per coat)
- D. Metal – (Galvanized; Ceiling, Ductwork)



1. Dryfall Waterborne Systems
  - a. Eggshell Finish
    - 1st Coat: S-W Pro Industrial Waterborne Acrylic Dry-Fall Eg-Shel, B42W82
    - 2nd Coat: S-W Pro Industrial Waterborne Acrylic Dry-Fall Eg-Shel, B42W82 (1.9 – 2.9-mil dry per coat)
  
- E. Metal – (Structural Steel Columns, Joists, Trusses, Beams, Miscellaneous & Ornamental Iron, Structural Iron, Ferrous Metal)
  1. Latex Systems
    - a. Semi-Gloss Finish
      - 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Primer, B66W1300 Series (2.0 – 4.0-mil dry) – MPI #107
      - 2nd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series – MPI #153
      - 3rd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series (2.5 - 4.0 mils dry per coat)
    - b. Eg-Shel/Satin Finish
      - 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Primer, B66W1300 Series (2.0 – 4.0-mil dry) – MPI#107
      - 2nd Coat: S-W Pro Industrial DTM Acrylic Eg-Shel Coating, B66W1250 Series – MPI #151X-Green
      - 3rd Coat: S-W Pro Industrial DTM Acrylic Eg-Shel Coating, B66W1250 Serie (2.5 - 4.0-mil dry per coat)
  2. Epoxy Systems (Water Base)
  3. Dryfall Waterborne System on non-pre-primed material
    - a. Eggshell Finish
      - 1st Coat: S-W Pro Industrial Pro-Cryl® Universal Primer, B66W1300 Series (5.0 – 10.0-mil dry) – MPI #107
      - 2nd Coat: S-W Pro Industrial Waterborne Acrylic Dry-Fall Eg-Shel, B42W82 – MPI #155
      - 3rd Coat: S-W Pro Industrial Waterborne Acrylic Dry-Fall Eg-Shel, B42W82 (3.0 – 4.5-mil dry per coat)
  4. Dryfall Waterborne System on pre-primed material
    - a. Eggshell Finish
      - 1st Coat: S-W Pro Industrial Waterborne Acrylic Dry-Fall Eg-Shel, B42W82 – MPI #155
      - 2nd Coat: S-W Pro Industrial Waterborne Acrylic Dry-Fall Eg-Shel, B42W82 (3.0 – 4.5-mil dry per coat)
  
- F. Wood (Walls, Ceilings, Doors, Trim)
  1. Latex Systems
    - a. Semi-Gloss Finish
      - 1st Coat: S-W Premium Wall & Wood Primer, B28W8111 (4-mil wet, 1.8-mil dry) – MPI# N/A
      - 2nd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series – MPI #153
      - 3rd Coat: S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series (2.5 – 4.0-mil dry per coat)
    - b. Eg-Shel/Satin Finish

- 1st Coat: S-W Premium Wall & Wood Primer, B28W8111 (4-mil wet, 1.8-mil dry) – MPI# N/A
- 2nd Coat: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series – MPI #N/A
- 3rd Coat: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series (1.6-mil dry per coat)

G. Stain Systems

1. Satin Finish

- 1st Coat: S-W 61807000 Minwax Water Based Wood Stain
- 2nd Coat: S-W 61807000 Minwax Water Based Wood Stain
- 3rd Coat: S-W Minwax Water Based Oil Modified Polyurethane Varnish, Satin Clear

H. Drywall (Walls, Ceiling, etc.)

1. Latex Systems

a. Eg-Shel/Satin Finish

- 1st Coat: S-W Premium Wall & Wood Primer, B28W8111 (4-mil wet, 1.8-mil dry) – MPI #N/A
- 2nd Coat: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series – MPI #144 X-Green
- 3rd Coat: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series (1.6-mil dry per coat)

b. Flat Finish Ceiling Only

- 1st Coat: S-W Premium Wall & Wood Primer, B28W8111 (1.8-mil dry) – MPI #N/A
- 2nd Coat: S-W Harmony Low Odor Interior Latex Flat, B5 Series – MPI #53X-Green
- 3rd Coat: S-W Harmony Low Odor Interior Latex Flat, B5 Series (1.6-mil dry per coat)

2. Epoxy System (Water Base)

a. Eg-Shel Finish

- 1st Coat: S-W Premium Wall & Wood Primer, B28W8111 (1.8-mil dry) – MPI #N/A
- 2nd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy Eg-Shel, B73-360 / B73V300 – MPI #254X-Green
- 3rd Coat: S-W Pro Industrial Water Based Catalyzed Epoxy Eg-Shel, B73-360 / B73V300 (2.0- 4.0-mil dry per coat)

2.5 MATERIALS – GENERAL REQUIREMENTS

A. Paints and Coatings – General

1. Unless otherwise indicated, provide factory-mixed coatings.
2. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application.
3. Do not reduce, thin, or dilute coatings or add materials to coatings unless approved in manufacturer's product instructions.
4. Confirm VOC's need by using the products MSDS sheets.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

## 2.6 ACCESSORIES

- A. Coating application accessories: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required, per manufacturer's specifications.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows (Do not apply finishes unless moisture content of surfaces are below the following maximums):
  - 1. Concrete: 12 percent.
  - 2. Fiber-Cement Board: 12 percent.
  - 3. Masonry (Clay and CMUs): 12 percent.
  - 4. Wood: 15 percent.
  - 5. Gypsum Board: 12 percent.
  - 6. Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.
- E. Do not begin application of coatings until substrates have been properly prepared; notify Owner's Representative of unsatisfactory conditions before proceeding.
- F. If substrate preparation is the responsibility of another installer, notify Owner's Representative of unsatisfactory preparation before proceeding.
- G. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.
- H. Test shop applied primer for compatibility with subsequent cover materials.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting. After completing painting

operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. The surface shall be dry and in sound condition. Remove all oil, dust, dirt, loose rust, peeling paint, or other contamination to ensure good adhesion.
- E. Provide barrier coats over incompatible primers or remove and re-prime. Notify Architect in writing about anticipated problems using the specified finish coat material with substrates primed by others.
- F. Impervious Surfaces:
  - 1. Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach.
  - 2. Rinse with clean water and allow surface to dry.
- G. Aluminum Surfaces:
  - 1. Remove all oil, grease, dirt, oxide, and other foreign material by cleaning per SSPC-SP1 Solvent Cleaning.
- H. Block/Unit Masonry (Cinder and Concrete)
  - 1. Remove all loose mortar and foreign material.
  - 2. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners.
  - 3. Let concrete and mortar cure at least 30 days at 75°F unless the manufactures products are designed for application prior to the 30-day period.
  - 4. The pH of the surface and moisture content must be in accordance with the paint manufacturer's recommendations prior to painting.
- I. Concrete:
  - 1. Remove contamination by washing with an appropriate cleaner, rinse thoroughly.
  - 2. The pH of the surface and moisture content shall be in accordance with the paint manufacturer's recommendations prior to painting.
  - 3. Allow the surface to thoroughly dry.
  - 4. Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid or other etching cleaner. Flush floor with clean water to neutralize acid and allow to dry before painting.
  - 5. Fill bug holes, air pockets, and other voids under another section with a cement-patching compound of sufficient cohesive strength to support the specified coating system.
- J. Drywall:
  - 1. Shall be clean, dry and all dust removed prior to painting.
  - 2. All nail heads must be set and spackled.
  - 3. Tape all joints and cover with a joint compound.
  - 4. Spackled nail heads and tape joints shall be sanded smooth.
- K. Galvanized Surfaces:

1. Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils.
2. Apply a test area, priming as required.
3. Allow the coating to cure in accordance with the manufacturer's recommendation before testing.
4. Perform adhesion tests in accordance with ASTM 3359 Adhesion by Tape Test.
5. If adhesion is poor, then notify Owner's representative that additional surface preparation under another section is necessary to remove pre-treatments or contaminants that interfere with adhesion of the coating.

L. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.

M. Plaster Surfaces:

1. Shall allow to thoroughly dry for at least 30 days before painting, unless the manufacturer's products are designed for application prior to the 30-day period.
  - a. Bare plaster must be cured and hard prior to painting.
  - b. Correct any soft, porous, or powdery plaster per requirements under another section of the specifications.

N. Steel:

1. Check other sections for additional surface preparation and shop priming of bare steel surfaces.
2. Surface preparation shall include appropriate SSPC recommended methods.
3. Shop primer shall be compatible with the field-applied coatings.
4. Surfaces shall be dry and clean prior to the application of field-applied coatings.
5. Remove all contaminants in accordance with SSPC-SP1 Solvent Cleaning or SSPC Method recommended for condition of substrate.

O. Wood:

1. Shall be clean and dry, then prime and paint as soon as possible.
2. Scrape, sand, and spot prime knots and pitch streaks before a full priming coat is applied.
3. Patch all nail holes and imperfections with a wood filler or putty and sand smooth after application of primer.
4. Wood and Metal Doors Scheduled for Painting: Finish doors on tops, bottoms, and side edges same as hinge side face, unless otherwise indicated.
5. Seal with shellac any marks, which may bleed through surface finishes.

### 3.3 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
- D. Use only thinners approved by the paint manufacturer and only within recommended limits.

- E. Tinting: Tint each undercoat of lighter shade to facilitate identification of each coat where multiple coats of the same materials are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.
- F. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming surface treatment specified under other sections.
- G. Preparation and testing of existing painted surfaces, indicated to be repainted to accommodate new work, shall be performed as work of this section.

### 3.4 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
- B. Use applicators and techniques suited for paint and substrate indicated.
- C. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
- D. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
- E. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- F. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- G. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- H. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- I. Apply paint in a cross-hatch application to achieve an even coverage.

### 3.5 FIELD QUALITY CONTROL

- A. The right is reserved by Owner/Architect to invoke the following material testing procedure in addition to other tests indicated when and as often as he deems necessary during the period of field painting.
- B. Engage services of an independent testing laboratory to sample paint being used. Samples of materials delivered to project site will be taken, identified and sealed, and certified in presence of Contractor.
- C. Testing laboratory will perform appropriate tests for one or each of the following characteristics: Abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated

weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance, and quantitative materials analysis.

- D. A test patch for applied paint adhesion may be required.
  - 1. Adhesion test shall provide the adhesion X-cut and tape test for adhesion per ASTM D3359 for areas selected by the Architect.
  - 2. Areas found to be defective shall have paint removed and repainting shall be provided.
  - 3. Owner/Architect may require retesting.
  
- E. A test patch for remedial painting adhesion may also be required. The procedure for the test patch is as follows:
  - 1. An area that represents the worst condition of the existing paint is selected.
  - 2. The surface is prepared as appropriate for the repaint work.
  - 3. The new coating or coating system is applied.
  - 4. The coating is allowed to cure for at least 7 days at 75 degrees F. or according to the coating manufacturer's instructions.
  - 5. After proper curing the adhesion is tested using an acceptable method such as the Adhesion by Tape Test (ASTM D 3359).
  
- F. If test results show that material being used does not comply with specified requirements, Contractor may be directed to stop painting work, and remove noncomplying paint; pay for testing; repaint surfaces coated with rejected paint; remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the 2 coatings are noncompatible.

### 3.6 EQUIPMENT

- A. Refer to Divisions 21, 22, 23, 26, 27, & 28 for schedule of color-coding and identification banding of equipment, ductwork, piping, and conduit.
  
- B. Color code equipment, piping, conduit, and exposed ductwork in accordance with requirements indicated.
  - 1. Color band and identify with flow arrows, names, and numbering.
  
- C. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
  
- D. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
  - 1. Paint the following work where exposed in equipment rooms:
    - a. Equipment, including both sides of panelboards.
    - b. Uninsulated metal and plastic piping.
    - c. Pipe hangers and supports.
    - d. Metal and plastic conduit.
    - e. Tanks that do not have factory-applied final finishes.
  - 2. Paint the following work where exposed in occupied spaces:
    - a. Equipment, including both side of panelboards.
    - b. Uninsulated metal and plastic piping.
    - c. Pipe hangers and supports.
    - d. Metal and plastic conduit.

- e. Duct, insulation having cotton or canvas insulation covering or other paintable jacket material.
- f. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- g. Interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint.
- h. Paint dampers exposed behind louvers and grilles to match face panels.
- i. Other items as directed by Architect.

### 3.7 CLEAN-UP AND PROTECTION

- A. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- B. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- C. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- D. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- E. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- F. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### 3.8 TOUCH-UP AND DAMAGE REPAIR

- A. Contractor shall repair all deficiencies in coating application in accordance with PDCA Standard P1-04.
- B. Inform Owner's representative of all damage to properly painted surfaces and receive authorization prior to performing damage repair.

### 3.9 SITE ENVIRONMENTAL PROCEDURES

- A. Indoor Air Quality: Provide temporary ventilation as specified in specification section – "Temporary Facilities and Controls."
- B. Waste Management: As specified in specification section – "Temporary Facilities and Controls" and as follows:



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1. Coordinate with manufacturer for take-back program. Set aside scrap to be returned to manufacturer for recycling into new product. Close and seal all partially used containers of paint to maintain quality as necessary for reuse.

END OF SECTION 09 91 23



## SECTION 10 11 00 – VISUAL DISPLAY UNITS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Markerboards.
    - b. Tackboards.
    - c. Accessories.

#### 1.3 DEFINITIONS

- A. Visual Display Board Assembly: Visual display surface that is factory fabricated into composite panel form, either with or without a perimeter frame; includes chalkboards, markerboards.
- B. Visual Display Surface: Surfaces that are used to convey information visually, including surfaces of chalkboards, markerboards and surfacing materials that are not fabricated into composite panel form but are applied directly to walls.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for visual display surfaces.
- B. Shop Drawings: For visual display surfaces. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Show locations of panel joints.
  - 2. Include sections of typical trim members.
- C. Samples for Initial Selection: For each type of visual display surface indicated, for units with factory-applied color finishes, and as follows:
  - 1. Actual sections of porcelain-enamel face sheet assembly.
  - 2. Fabric swatches of fabric-faced tack assemblies.
  - 3. Include accessory Samples to verify color selected.

- D. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- E. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For visual display surfaces to include in maintenance manuals.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of visual display units.
- B. Source Limitations: Obtain visual display surfaces from single source from single manufacturer.
- C. 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. Flame-Spread Index: 25.
  2. Smoke-Developed Index: 450 or less.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver factory-built visual display surfaces, including factory-applied trim where indicated, completely assembled in one piece without joints, where possible. If dimensions exceed

maximum manufactured panel size, provide two or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefabricate components at the factory, disassemble for delivery, and make final joints at the site.

- B. Store visual display surfaces vertically with packing materials between each unit.

## 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install visual display surfaces until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Verify actual dimensions of construction contiguous with visual display surfaces by field measurements before fabrication.
  - 1. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

## 1.9 WARRANTY

- A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer's standard form in which manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Surfaces lose original writing and erasing qualities.
    - b. Surfaces exhibit crazing, cracking, or flaking.
  - 2. Warranty Period: Life of the building.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Claridge Products and Equipment, Inc.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Alliance Wall Corp.
  - 2. Best-Rite Chalkboard, Co.
  - 3. Carolina Chalkboard
  - 4. Greensteel, Inc.
  - 5. Nelson-Adams

6. Peninsular Slate, Co.

2.2 MARKERBOARD ASSEMBLIES

A. Basis of Design: "Series 4 – 800L"

B. Materials

1. Porcelain-Enamel Markerboards: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction consisting of backing sheet, core material, and 24-gauge, porcelain-enamel face sheet with off white low-gloss finish.
2. Particleboard Core: 3/8" thick; with 0.015-inch- thick, aluminum sheet backing.
3. Laminating Adhesive: Manufacturer's standard, moisture-resistant thermoplastic type.
4. Size: As indicated on drawings.

C. Accessories

1. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch-thick, extruded 1" wide aluminum; manufacturers standard size and shape.
  - a. Factory-Applied Trim: Manufacturer's standard, with mitered corners.
2. Chalktray: Manufacturer's standard, continuous.
  - a. Solid Type: Extruded aluminum with ribbed section and smoothly curved exposed ends.
3. Map Rail: Provide the following accessories:
  - a. Display Rail: Continuous and integral with map rail; fabricated from cork approximately 1 to 2 inches wide.
  - b. End Stops: Located at each end of map rail.
  - c. Map Hooks: Two map hooks for every 48 inches of map rail or fraction thereof.
  - d. Map Hooks and Clips: Two map hooks with flexible metal clips for every 48 inches of map rail or fraction thereof.
  - e. Flag Holder: One for each room.
  - f. Paper Holder: Extruded aluminum; designed to hold paper by clamping action.
4. Markerboard Splices: Adjoining markerboards shall be joined by steel concealed spline to assure alignment and hairline joints.

2.3 TACKBOARD ASSEMBLIES

A. Materials

1. Cork: 1/4" thick cork, seamless single layer compressed fine grain bulletin board quality face sanded for natural finish laminates to substrate.
2. Substrate: 1/4" thick minimum Industrial Grade fiberboard core material with 0.015" thick aluminum sheet backing.
3. Vinyl Fabric Facing; Mildew resistant, washable 2-ply 100 percent recycled polyester fabric with a plain weave pattern. Comply with FS CCC-W-408 Type II, laminated to core.
4. Trim: Manufacturer's standard aluminum trim, with mitered corners.
5. Size: As indicated on drawings.

## 2.4 MATERIALS

- A. Hardboard: ANSI A135.4, tempered.
- B. Particleboard: ANSI A208.1, Grade M-1
- C. Fiberboard: ASTM C 208.
- D. Extruded Aluminum: ASTM B 221, Alloy 6063.

## 2.5 FABRICATION

- A. Markerboard Assemblies: Laminate porcelain-enamel face sheet and backing sheet to core material under heat and pressure with manufacturer's standard flexible, waterproof adhesive.
- B. Tackboard Assemblies: Coordinate factory-assembled units with trim and accessories indicated. Join parts with a neat, precision fit.
- C. Aluminum Frames and Trim: Fabricate units straight and of single lengths, keeping joints to a minimum. Miter corners to a neat, hairline closure.
- D. Make joints only where the total length exceeds the maximum manufactured length, fabricate with the minimum number of joints, balanced around the center of the board, as acceptable to the Architect and Owner.
- E. Provide the manufacturer's standard vertical joint system between abutting sections of marker board.
- F. Provide the manufacturer's standard mullion trim at joints between marker boards and tack boards.

## 2.6 WALL ATTACHMENT

- A. Markerboard and Tackboard Fasteners as follows:
  - 1. CMU: Butterfly bolts into block core
  - 2. Drywall: Metal screws into metal stud system
  - 3. CMU and Drywall: Adhesive as recommended by manufacturer.
- B. Tackable Wall Surface
  - 1. CMU and Drywall: Adhesive as recommended by manufacturer.
- C. Space all markerboards and tackboards 1/2" away from wall surface at walls adjacent to the exterior, and provide aluminum closure strip full length at sides to close of space.

## 2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.8 ALUMINUM FINISHES

- A. Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: non-specular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine walls and partitions for proper preparation and backing for visual display surfaces.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances that could impair the performance of and affect the smooth, finished surfaces of visual display boards, including dirt, mold, and mildew.
- C. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display surfaces and wall surfaces.
  - 1. Prime wall surfaces indicated to receive and as recommended in writing by primer/sealer manufacturer and wall covering manufacturer.

### 3.3 INSTALLATION, GENERAL

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
  - 1. Markerboard mounting height 36" above finished floor to rail or as indicated on the drawings.



2. Tackboard mounting height 36" above finished floor to rail or as indicated on the drawings.

B. Mounting: Assemblies shall be mounted with concealed fasteners, mastic adhesive will not be permitted.

### 3.4 INSTALLATION OF FACTORY-FABRICATED VISUAL DISPLAY BOARDS AND ASSEMBLIES

A. Visual Display Boards: Attach concealed clips, hangers, and grounds to wall surfaces and to visual display boards with fasteners at not more than 16 inches o.c. Secure both top and bottom of boards to walls.

### 3.5 CLEANING AND PROTECTION

A. Clean visual display surfaces according to manufacturer's written instructions. Attach one cleaning label to visual display surface in each room.

B. Touch up factory-applied finishes to restore damaged or soiled areas.

C. Cover and protect visual display surfaces after installation and cleaning.

END OF SECTION 10 11 00



## SECTION 10 14 16 – PLAQUES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - a. Cast Dedication Plaque.

#### 1.3 ACTION SUBMITTALS

- A. Shop Drawings: For plaques.

- 1. Include fabrication and installation details and attachments to other work.
- 2. Show plaque mounting heights, locations of supplementary supports to be provided by others, and accessories.
- 3. Show message list, typestyles, border type, graphic elements, including raised characters, and layout for each plaque at full size in PDF format.
- 4. Provide rubbing of actual pattern for architect's approval prior to casting.
- 5. Verify names, titles and exact wording required for plaque prior to fabrication.

- B. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:

- 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
- 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
- 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
- 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

- C. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:

1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.

#### 1.5 PRE-INSTALLATION MEETING

- A. The contractor shall conduct a pre-installation meeting at the project site a minimum of 30 days prior to any work being installed as indicated in this section and other related sections that require coordination with this section.

#### 1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of plaques that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Deterioration of finishes beyond normal weathering.
    - b. Deterioration of embedded graphic image.
  2. Warranty Period: Five (5) years from date of Substantial Completion.

#### 1.7 ENVIRONMENTAL

- A. VOC Content: Determine VOC content of solvent borne, water borne paints and related coatings per EPA method 24 or ASTM D3960.
- B. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regionally manufactured materials. Include statement indicating cost for each regionally manufactured material.
  1. Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.
- C. Product Data for Credit IEQ 4.1: For adhesives, documentation including printed statement of VOC content.

- D. Laboratory Test Reports for Credit IEQ 4.1: For adhesives, documentation indicating that products 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 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer shall be one of the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
1. Andco Industries, Inc.
  2. ASI Sign Systems.
  3. Baron Signs
  4. Southwell

### 2.2 MATERIALS

- A. Cast Plaque: Plaque with background texture, border, and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. Plaque Material: Aluminum Alloy F-214.
  2. Plaque Thickness: 0.75 inch at perimeter border.
  3. Integral Metal Finish: Mill finish raised surface with dark oxidized background.
  4. Background Texture: Stipple.
  5. Integrally Cast Border Style: Square single line, polished, 1/2" wide.
  6. Mounting: Concealed studs, verified by Architect.
  7. Text and Typeface: Arial Bold, raised and satin finish.
  8. Finish Coat: Plaque shall be cleaned and sprayed with 2 coats of clear lacquer.
  9. Border: As selected by the Architect and satin finish.
  10. Size: 18 inches wide by 24 inches high.
  11. Corners and Edges: Square corners and beveled edges.

### 2.3 ACCESSORIES

- A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of plaques, noncorrosive and compatible with each material joined, and complying with the following:
1. Use concealed fasteners and anchors unless indicated to be exposed.
  2. Plaque Mounting Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of plaque, screwed into back of plaque, or screwed into tapped lugs cast integrally into back of plaque, unless otherwise indicated.

### 2.4 FABRICATION

- A. General: Provide manufacturer's standard plaques according to requirements indicated.

1. Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove gate marks, casting flash, and other casting marks before finishing.

## 2.5 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable.
- C. Finish: Apply clear acrylic lacquer to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

## 2.6 ENVIRONMENTAL

- A. VOC Content: Determine VOC content of solvent borne, water borne paints and related coatings per EPA method 24 or ASTM D3960.
- B. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regionally manufactured materials. Include statement indicating cost for each regionally manufactured material.
  1. Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.
- C. Product Data for Credit IEQ 4.1: For adhesives, documentation including printed statement of VOC content.
- D. Laboratory Test Reports for Credit IEQ 4.1: For adhesives, documentation indicating that products 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 substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of plaque work.
- B. Verify that plaque-support surfaces are within tolerances to accommodate plaques without gaps or irregularities between backs of plaques and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Install plaques using mounting methods indicated and according to manufacturer's written instructions.
- B. Install plaques level, plumb, true to line, and at locations and heights indicated, with plaque surfaces free of distortion and other defects in appearance.
- C. Install plaques so they do not protrude or obstruct according to the accessibility standard.
- D. Before installation, verify that plaque surfaces are clean and free of materials or debris that would impair installation.
- E. Mounting Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of plaque. Remove loose debris from hole and substrate surface.
  - 1. Concrete Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place plaque in position and push until flush to surface, embedding studs in holes. Temporarily support plaque in position until adhesive fully sets.

### 3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed plaques and plaques that do not comply with specified requirements. Replace plaques with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as plaques are installed.
- C. On completion of installation, clean exposed surfaces of plaques according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain plaques in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 16





## SECTION 10 14 23 – PANEL SIGNAGE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Identification signage.
    - b. Specialty signage.
    - c. Exterior building signage.

#### 1.3 REFERENCES

- A. ASTM B26/B26M – Standard Specification for Aluminum-Alloy Sand Castings.
- B. ADAAG – Americans with Disabilities Act Accessibility Guidelines; US Architectural and Transportation Barriers Compliance Board.
- C. ANSI A117.1 – Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- D. NFPA 101 – 7.10.1.3.
- E. FAC – Florida Accessibility Code.
- F. FBC – Florida Building Code.

#### 1.4 DEFINITIONS

- A. Accessible: In accordance with the accessibility standard.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type sign material and accessories.
- B. Shop Drawings: For panel signs.
  - 1. Include fabrication and installation details and attachments to other work.
  - 2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
  - 3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign.

- C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
  - 1. Include representative Samples of available typestyles and graphic symbols.
- D. Sign Schedule: Use same designations specified or indicated on Drawings.
- E. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- F. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than five (5) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site.
- B. Package signs, labeled in name groups.
- C. Store adhesive attachment tape at ambient room temperatures.

1.8 FIELD CONDITIONS

- A. Do not install signs when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Deterioration of finishes beyond normal weathering.
    - b. Deterioration of embedded graphic image.
    - c. Separation or delamination of sheet materials and components.
  - 2. Warranty Period: Five (5) years from date of Substantial Completion.

1.10 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.
- B. Code Standards: Signage shall comply with the Florida Building Code and other applicable codes and their requirements shall govern.
- C. ADA requirements supersede technical specifications in this Section.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer shall be one of the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Andco Industries, Inc.
  - 2. APCO Graphics, Inc.
  - 3. ASI Sign Systems
  - 4. Best Sign Systems
  - 5. Environmental Graphics, Inc.
  - 6. Sign Design
  - 7. Multi-Graphics, Inc.
  - 8. InPro Corporation
  - 9. Baron Signs

2.2 FLORIDA AMERICANS WITH DISABILITIES ACT REQUIREMENTS

- A. Manufacturer shall conform to tactile, Braille, letter size, and other requirements as required by Florida Accessibility Code for Building Construction and ANSI A117.1.
- B. ADA requirements supersede technical specifications in this Section.
- C. Pictograms shall have the equivalent verbal description directly below the pictogram.

2.3 SIGNS

- A. General; applies to all signs except as noted:
  - 1. Material shall be minimum 1/8" clear matte acrylic stock with 3/8" radius corners.
    - a. Exterior signs – Shall be UV stable material of non-petroleum base phenolic resin using a process to create the raised lettering, which is an integral part of the sign.
    - b. Interior signs – Shall be material of non-petroleum base phenolic resin using a process to create the raised lettering, which is an integral part of the sign.
    - c. Interior signs exposed to direct sun, shall be of same material as exterior signs.
    - d. Paint shall be Matthews Acrylic Polyurethane system or equal.
      - 1) Shall be low VOC
      - 2) Shall be UV Stable
      - 3) Shall be lead and chromate free
      - 4) Minimum life expectancy of 10-years
  - 2. Applied lettering not allowed.
  - 3. Letters and background colors selected by Architect from manufacturer's standard colors.
  - 4. Mounting:
    - a. Shall be mounted in a bed of adhesive and secured with non-removable vandal resistant stainless steel oval head screws.
    - b. Shall be double sided tape and adhesive.
    - c. Mount at locations as directed by Architect.
    - d. Mount at 60" above finished floor to the center of the sign and as indicated on the drawings.
    - e. Exterior signage shall be mounted in a bed of sealant and secured with non-removable vandal resistant oval head stainless steel screws.
  - 5. Graphic Process with Braille in one of the following to provide raised letters, but no applied lettering method allowed:
    - a. Provide raised (photopolymer process)
    - b. Engraved letters
    - c. Sand craved process
  - 6. Letters:
    - a. Letters and numbers shall have width to height ratio between 3:5 and 1:1 and stroke width to height ratio between 1:5 and 1:10.
    - b. Letters and numbers to be raised 1/32" and 3/4" minimum and 2" maximum height unless indicated otherwise on the drawings or within the specifications.
    - c. Letters and numbers to be Sans Serif font with Grade 2 Braille, verify font type with the Architect.
    - d. Pictograms shall have the equivalent verbal description directly below the pictogram.
  - 7. Characters and backgrounds must be matte or other non-glaze surface with dark matte background and white letters.
  - 8. Size of signs shall be indicated on drawing.
  - 9. All signs shall comply with applicable codes.

B. Room Name and Number Signs

1. Provide signs for each room or space to include a combination name and room number (FISH) sign as indicated on the drawings.
  - a. Minimum size of 4" high by 6" wide for signs (longer where nomenclature demands) or as indicated on the drawings.
2. Provide additional sign for each door in a space with multiple doors.
3. Attach with 2 screws and adhesive.

C. Capacity Signs

1. For all rooms with a capacity of 50 persons or more as shown on the drawings or other rooms as indicated on the plans.
2. Furnish and install signage, 3" high by length required, reading "MAXIMUM CAPACITY".
3. Allow for 3-digits maximum after "maximum capacity", copy as shown on the drawings.
4. Attach with 2 screws and adhesive.

D. Toilet Room Handicapped Signs

1. Furnish and install one sign depicting National Handicapped Symbol (wheelchair) at each toilet room, equipped with facilities for the handicapped.
  - a. Size shall be 6" wide by 10.5" high minimum or as indicated on the drawings.
  - b. Pictogram shall be on a 6" x 6" field minimum and shall comply with applicable codes.
  - c. Attach with 4 screws and adhesive.

E. Fire Rated/Smoke Barrier Partition Labeling

1. Field label all fire rated walls and smoke barriers above ceiling level, with verbiage as follows:
2. Provide minimum 1-1/2" high block lettering stenciled on wall above finished ceiling, if in a storage, mechanical, electrical, or similar unfinished room, install at approximately 84 inches above floor.
3. Verbiage shall be "FIRE AND/OR SMOKE BARRIER – PROTECT ALL OPENINGS".
4. Repeat verbiage at intervals not exceeding 30' - 0" o.c. measured horizontally along the wall or partition.

F. Mechanical, Electrical, data and Similar Rooms

1. Provide and install a sign mounted on the door to read as follows: "STORAGE NOT ALLOWED"
2. Signs shall be matte acrylic plastic, red background with white letters 1" high by width needed for copy and Braille.
3. Sign shall be permanently attached (Attached in way as to maintain the rating of the door) to the inactive door near the latch side 60 inches from finished floor to center of sign.
4. Mount on doors with non-removable oval head screws verify number signs required.
5. If these rooms have pair of doors, provide sign saying "THIS DOOR TO REMAIN CLOSED, EXCEPT DURING THE TRANSFER OF EQUIPMENT".
6. Attach with 2 screws and adhesive.

G. Fire Extinguisher and Pull Station Sign

1. Copy to read: "Fire Pull Station Inside", And "Fire Extinguisher Inside"
2. Braille sign not required for fire extinguisher sign.
3. See plans for locations.

4. Placement of a "Fire Extinguisher Inside" sign is not required for rooms with a keyed lockset such as; Electrical or Mechanical.
5. Attach with 2 screws and adhesive.

H. Evacuation Plan Signage

1. Provide frame for a graphic floor plan in each occupied room as indicated.
  - a. Size to be nominal 9" high by 12" width.
  - b. Provide a clear removable plastic cover over each sign.
  - c. Sign cover will only be removable using a tool.
2. Frame Material: Matte acrylic plastic with all edges eased and tempered glass or clear plastic cover
3. Location: Provide in all rooms with a capacity of 6 or more occupants.
4. Mounting: Non-removable oval head screws, using rawl plugs where mounted on masonry.
5. Architect shall supply the plans to the Contractor.
6. Attach with 4 screws and adhesive.

I. Fire Extinguisher Bracket Sign

1. Provide 8" x 8" minimum plastic sign on the wall above the mounting bracket. Lettering shall comply with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
2. Provide at hand held extinguishing units not in fire protection cabinets.
3. Sign shall be fabricated with the words "FIRE EXTINGUISHER INSIDE" in red letter letters applied to the white plastic sign surface.
  - a. Orientation: Horizontal.
4. Attach with 4 screws and adhesive.

J. Location

1. Signs are to be placed on the wall adjacent to the latch side of the door.
2. The dimension from the floor to the centerline of the sign or sign grouping is to be 60".
3. For double doors, or if no wall space exists, sign is to be placed on the nearest adjacent wall.
4. Space from door swing or any obstacles is to be a minimum of 3".
5. For overhead signs, the clearance is to be 6' 8" (80").

2.4 EXTERIOR BUILDING SIGNAGE

A. Room Name and Number Signs

1. Provide signs for each room or space to include a name and room number as indicated on the Drawings.
  - a. Minimum size of 3" high by 6" wide for signs (longer where nomenclature demands) or as indicated on the drawings.
2. Provide a sign for each exterior door in a space.

B. Fire Alarm Pull Station Inside Sign

1. Sign 6" x 6" x 0.125", acrylic background, red matte.
2. White letters, size proportional to sign dimensions (minimum height to be 5/8")

3. Unit shall be equal to "Volmar 18T" Series.
4. All interior fire alarm pull stations shall have this signage at the nearest exterior door.
5. Provide Grade 2 Braille pictogram on fire alarm signage matching sign message.
6. Attach with 4 screws.

C. Building Identification Lettering – Provide letters meeting the following requirements:

1. Type: "Helvetica" Letter Style, verify font type with the Architect. Provide minimum sufficient letters for facility name and address as indicated on drawings.
2. Letters: Letters shall have width to height ratio between 3:5 and 1:1 and a stroke width to height ratio between 1:5 and 1:10.
3. Material: Cast 514 alloy aluminum back-channel letters.
4. Color: Mirror Polish Aluminum with a "Durepox" protective finish.
5. Sizes:
  1. Text Size
    - i) 18 inches high x length as required for proper optical letter spacing.
    - ii) 2 inches depth
  2. Text Quantity: See drawings for quantity of text and verify with the Architect.
6. Anchors: Stainless steel drilled in place concealed anchors minimum 2 anchors per letter.
7. Install using manufacturers approved anchoring method to meet ASTM 7 wind load requirements.
8. Caulk: Seal perimeter of each letter to wall or frame with thin neat bead of clear silicone sealant.

D. Exterior Flat Cut Lettering and Logo – Provide letters and Logo meeting the following requirements:

1. Type: "Helvetica" Letter Style, verify font type with the Architect. Provide minimum sufficient letters for facility name and address as indicated on drawings.
2. Letters: Letters shall have width to height ratio between 3:5 and 1:1 and a stroke width to height ratio between 1:5 and 1:10.
3. Material: Flat laser cut aluminum.
4. Color: Mirror Polish Aluminum with a "Durepox" protective finish.
5. Sizes:
  1. Text and Logo Size
    - i) As indicated on drawings.
    - ii) 3/8" thick
  2. Text Quantity: See drawings for quantity of text and verify with the Architect.
6. Anchors: Stainless steel drilled in place concealed anchors minimum 2 anchors per letter.
7. Install using manufacturers approved anchoring method to meet ASTM 7 wind load requirements.
8. Caulk: Seal perimeter of each letter to wall or frame with thin neat bead of clear silicone sealant.

## 2.5 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:

1. Stainless-steel devices unless otherwise indicated.
  - a. Fastener Heads: Use oval countersunk screws and bolts with tamper-resistant Allen-head or spanner-head slots unless otherwise indicated.

## 2.6 MATERIALS

- A. Polycarbonate Sheet: Of thickness indicated, manufactured by extrusion process, coated on both surfaces with abrasion-resistant coating:
  - 1. Impact Resistance: 16 ft-lbf/in. per ASTM D 256, Method A.
  - 2. Tensile Strength: 9000 lbf/sq. in. per ASTM D638.
  - 3. Flexural Modulus of Elasticity: 340,000 lbf/sq. in. per ASTM D 790.
  - 4. Heat Deflection: 265 deg F at 264 lbf/sq. in per ASTM D 648.
  - 5. Abrasion Resistance: 1.5 percent maximum haze increase for 100 revolutions of a Taber abraser with a load of 500 g per ASTM D 1044.

## 2.7 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

## 2.8 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining 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 substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
  - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
  - 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
  - 3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.



4. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.
- B. Room-Identification Signs and Other Accessible Signage: Install in locations on walls as indicated and according to accessibility standard.
- C. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
  1. Signs Mounted on Glass: Provide matching opaque plate on opposite side of glass to conceal mounting materials.
- D. Mounting Methods:
  1. Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners and tighten.
- E. Provide fire rated/smoke barrier partitioning labeling at rated partitions.

### 3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 10 14 23



## SECTION 10 21 13 – HDPE TOILET COMPARTMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Toilet enclosures.
    - b. Urinal screens.

#### 1.3 REFERENCES

- A. Florida Building Code, Chapter 11 – Florida Accessibility Code for Building Construction.
- B. ANSI A117.1 – Safety Standards for the Handicapped.
- C. ASTM A167 – Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- D. ASTM B86 – Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings.
- E. ASTM B221 – Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- F. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- G. NFPA – 101 Life Safety Code.
- H. NFPA 286 – Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- I. FBC – Florida Building Code.
- J. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" for toilet compartments designated as accessible.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
  - 1. Show locations of reinforcements for compartment-mounted grab bars.
  - 2. Show locations of centerlines of toilet fixtures.

- C. Samples: Include Samples of hardware and accessories involving material and color selection.
- D. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- E. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 INFORMATION SUBMITTALS

- A. Product Certificates: For each type of toilet compartment, from manufacturer.

#### 1.6 CLOSEOUT SUBMITTAL

- A. Maintenance Data: For toilet compartments to include in maintenance manuals.

#### 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents and source.
  - 1. Door Hinges: Two hinges with associated fasteners.
  - 2. Latch and Keeper: One latch and keeper with associated fasteners.
  - 3. Door Bumper: Two bumpers with associated fasteners.
  - 4. Door Pull: One door pull with associated fasteners.
  - 5. Fasteners: Ten fasteners of each size and type.

1.8 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.

1.9 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver items in manufacturer's original unopened protective packaging.
- B. Store the materials in original protective packaging to prevent physical damage.
- C. Handle material in a way to prevent damage to finished surfaces.

1.10 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, and other construction contiguous with toilet compartments by field measurements before fabrication.

1.11 WARRANTY

- A. Warranty: Manufacturer's standard twenty-five (25) year limited warranty for panels, doors, and tiles against breakage, corrosion, delamination, and defects in factory workmanship.
- B. Manufacturer's standard one (1) year guarantee against defects in material and workmanship for door hardware and mounting brackets.

1.12 PERFORMANCE

- A. Comply with requirements in GSA's CID-A-A-60003, "Partitions, Toilets, Complete."
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Fire hazard classification: Class A flame spread/smoke developed rating, tested to ASTM E84.
  - 2. Flame-Spread Index: 75 or less.
  - 3. Smoke-Developed Index: 450 or less.
- C. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for toilet compartments designated as accessible.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.

1. Scranton Products.

- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.

1. ASI Global Partitions  
2. Bradley Corporation; Mills Partitions

### 2.2 GENERAL

- A. Basis of Design: "Hiny Hiders"

- B. Door, Panel and Pilaster Materials: Fabricated from solid 1' thick high-density polyethylene (HDPE) polymer resins under high pressure forming a single component section which is waterproof, corrosion-proof, impact resistant nonabsorbent, and has a self-lubricating surface that resists marking with pens, pencils, lipstick, and other writing or marking utensils.

- C. Waterproof and nonabsorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers, and other writing instruments.

- D. Fire hazard classification: Class A flame spread/smoke developed rating, tested to ASTM E84.

### 2.3 PARTITIONS

- A. Design Type: Standard height with door and panel height of 55 inches with floor clearance of 14 inches.

- B. Mounting Type: Floor-mounted, overhead-braced with pilaster height of 82 inches.

### 2.4 URINAL SCREENS

- A. Type: Wall mounted screen 48 inches high by 12 inches deep with floor clearance of 14 inches.

- B. Mounting Type: Floor and ceiling pilaster mounted.

### 2.5 COMPONENTS

- A. Pilaster Shoes: 3 inches high, 20-gauge stainless steel, secured to pilaster with stainless steel tamper resistant Torx head sex bolt.

- B. Wall Brackets: 54 inches long, stainless steel double flange continuous U-bracket, fastened to pilasters and panels with stainless steel tamper resistant Torx head sex bolts.
- C. Urinal Wall Bracket: 48 inches long, stainless steel double flange continuous U-bracket, fastened with stainless steel tamper resistant Torx head sex bolts.
- D. Overhead Brace: Heavy-duty extruded aluminum, anti-grip design, clear anodized finish, fastened to headrail bracket with stainless steel tamper resistant Torx head sex bolt and at top of pilaster with stainless steel tamper resistant Torx head screws.
- E. Headrail Brackets: 20 gage stainless steel, satin finish, secured to wall with stainless steel tamper resistant Torx head screws.
- F. Heat-Sink Strip: Manufacturer's standard continuous, extruded-aluminum strip fastened to exposed bottom edges of door and panel solid-polymer components to prevent burning.

## 2.6 HARDWARE

- A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.
- B. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel.
  - 1. Hinges: Continuous hinge fabricated from stainless steel, wrap-around flanges, through bolted to doors and pilasters with stainless steel, Torx head sex bolts. Hinges operate on field-adjustable nylon cams, field adjustable in 30-degree increments.
  - 2. Latch and Keeper: Stainless steel surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
  - 3. Coat Hook: Stainless steel combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
  - 4. Door Bumper: Stainless steel rubber-tipped bumper at out-swinging doors and entrance-screen doors.
  - 5. Door Pull: Stainless steel pull unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.
  - 6. Equip outswing handicapped doors with second door pull and door stop.

## 2.7 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M.
- B. Aluminum Extrusions: ASTM B 221 (ASTM B 221M).

## 2.8 FABRICATION

- A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.
- B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- C. Door Size and Swings: Unless otherwise indicated, provide 24-inch wide, in-swinging doors for standard toilet compartments and wide, out-swinging doors with a minimum 32-inch wide, clear opening for compartments designated as accessible.

## 2.9 FINISH

- A. Color and Pattern: Color and pattern as selected by Architect from manufacturer's full range.

## 2.10 ENVIRONMENTAL

- A. VOC Content: Determine VOC content of solvent borne, water borne paints and related coatings per EPA method 24 or ASTM D3960.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
  - 1. Confirm location and adequacy of wall and above ceiling blocking required for installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
  - 1. Maximum Clearances:
    - a. Pilasters and Panels: 1/2 inch.
    - b. Panels and Walls: 1/2 inch.
  - 2. Stirrup Brackets: Secure panels to pilasters with no fewer than three brackets attached at midpoint and near top and bottom of panel.
    - a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
    - b. Align brackets at pilasters with brackets at walls.



- B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

### 3.3 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30-degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 10 21 13



## SECTION 10 26 00 – WALL AND DOOR PROTECTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Surface-mounted corner guards.

#### 1.3 REFERENCES

- A. AISC – Stainless Steel, Uses in Architecture.
- B. ASTM A167 – Standard Specification for Stainless and Heat Resisting Chromium Nickel Steel Plate, Sheet, and Strip.
- C. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's standard, technical data and detailed specifications for each system component to show compliance with requirements.
  - 1. Include data for all required installation accessory units and complete installation instructions for each type of substrate as shown and/or indicated.
- B. Samples: Submit 6-inch long full-size sample.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Basis of Design Product: Subject to compliance with requirements provide the following manufacturer.
  - 1. Construction Specialties, Inc.

- B. The following manufacturers are acceptable provided they are equal or exceed the material requirements, color and functional qualities of the basis of design product.
  - 1. Arden Architectural Specialties, Inc.
  - 2. Pawling Corporation
  - 3. Inpro Corporation

## 2.2 CORNER GUARDS

- A. Basis of Design: "CO-8 – Mechanical Fastened"
- B. Assembly: Surface-mounted, corner guard with 3-1/2" legs and 90° corners, predrilled for stainless steel fasteners.
- C. Material: Fabricated from 0.063" thick stainless steel 304 alloy.
  - 1. Finish: #4 satin
- D. Height: 4' - 0"
- E. Locations: Corner guards shall be installed at all outside corners, unless indicated otherwise on the drawings.

## 2.3 FABRICATION

- A. Fabricate wall protection systems to comply with requirements indicated for design, dimensions, details, finish, and member sizes.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Inspection: Walls shall be in proper condition to receive units, and shall be installed plumb and shall be rigidly connected and properly secured to substrates per manufacturers recommendation.
- B. Installation of units shall not begin until wall finishes are complete, including painting.
- C. Surface Preparation: Prior to installation clean substrates to remove dirt, debris, and loose particles. Perform additional preparation procedures as required by the manufacturer.
- D. Protect material from damage during storage and installation.

### 3.2 INSTALLATION

- A. Install in accordance with the manufacturer's written instructions and reviewed shop drawings.

- B. Use only approved mounting methods as recommended by the manufacturer and locate all components firmly into position, level, and plumb.

### 3.3 CLEANING AND PROTECTION

- A. Immediately upon completion of installation, clean covers in accordance with the manufacturer's written instructions.
- B. Remove debris from the Project site.
- C. Protect installed components and materials to prevent damage by other trades.

END OF SECTION 10 26 00



## SECTION 10 28 00 – TOILET, BATH, AND LAUNDRY ACCESSORIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Toilet accessories.
    - b. Underlavatory guards.

#### 1.3 REFERENCES

- A. Florida Building Code, Chapter 11 – Florida Accessibility Code for Building Construction.
- B. ANSI A117.1 – Safety Standards for the Handicapped.
- C. ADA Accessibility Guidelines for Buildings and Facilities July 23, 2004 – Provisions for Children.
- D. ASTM A123 /A123M – Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- E. ASTM A167 – Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- F. ASTM A269 – Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- G. ASTM A666 – Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- H. ASTM A794 – Standard Specifications for Commercial Steel, Carbon, Cold-Rolled.
- I. ASTM B456 – Electro-deposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- J. ASTM C1036 – Standard Specification for Flat Glass.
- K. ASTM C1048 – Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass.
- L. ASTM C1503 – Standard Specification for Silvered Flat Glass Mirror.
- M. OSHA Department of Labor CFR 29, section 1910.141: Sanitation.
- N. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions gauges, dimensions of individual components and profiles, and finishes.
  - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

3. Include electrical characteristics.

B. Samples: Submit two samples of each accessory illustrating color and finish.

#### 1.5 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's special warranty.

B. Include maintenance instructions and manufacturer's list of replaceable parts and service recommendations.

#### 1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

#### 1.7 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.

C. Inserts and Anchorages: Provide accessory Manufacturers' standard inserts and anchoring devices that must be set in concrete or built into masonry. Coordinate delivery with other Work to avoid delay.

D. Field Verification: Before start of installation of wall finishes, installer shall verify that required blocking has been installed in proper locations. Verify that installation of finishes and required anchoring devices are complete.

E. Industry Standards: Work shall comply with applicable provisions of the following:

1. OSHA Department of Labor CFR 29, section 1910.141: Sanitation.
2. Florida Building Code, Chapter 11 – Florida Accessibility Code for Building Construction
3. ANSI A117.1 – Safety Standards for the Handicapped
4. ADA Accessibility Guidelines for Buildings and Facilities July 23, 2004 – Provisions for Children

#### 1.8 FIELD CONDITIONS

A. Coordinate accessory locations, installation, and sequencing with other Work to avoid interference with and ensure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.



- B. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- C. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

#### 1.9 WARRANTY

- A. Toilet Accessory Warranty: Provide manufacturer's one (1) year warranty from the Date of Substantial Completion, against defects in material and workmanship, unless otherwise indicated.
- B. Mirror Warranty: Submit a written warranty executed by mirror manufacturer, agreeing to replace any mirrors that develop visible silver spoilage defects within 15 years from the Date of Substantial Completion.

#### 1.10 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Bobrick
  - 2. Manufacturers listed in the schedule on the drawings.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Bradley Corporation
  - 2. American Specialties, Inc.
  - 3. AJW Architectural Products

#### 2.2 UNDERLAVATORY GUARDS

- A. Underlavatory Guard:
  - 1. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings. To be provided at all exposed piping. Provide Truebro Lav Guard 2 as manufacturer by IPS Corp.

2. Material and Finish: Antimicrobial, molded plastic, white.

## 2.3 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- B. Stainless Steel Tubing: ASTM A269/A269M, Type 304 or 316
- C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.
- D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.
- E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- H. Mirror Glass: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- I. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- J. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.
- K. Galvanized Steel Mounting Devices: ASTM A153, hot-dip galvanized after fabrication.
- L. Fasteners: Screws, bolts, and other devices of same material as accessory unit, or of galvanized steel where concealed.

## 2.4 FABRICATION

- A. No names or labels are permitted on exposed faces of toilet and bath accessory units. On either interior surface not exposed to view or on back surface, provide identification of each accessory item either by a printed, waterproof label or a stamped nameplate indicating Manufacturer's name and product model number.
- B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
- C. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors or access panels with full-length, stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.

- D. Keys: Provide universal keys for access to toilet accessory units requiring internal access for servicing, resupply, etc. Provide minimum of six keys to Owner's representative.

## 2.5 KEYING

- A. Supply four keys for each accessory to Owner.
- B. Provide a master-key system for all accessories.

## 2.6 FINISHES

- A. Galvanizing ASTM A123 to 1.25-oz/sq yd Galvanize ferrous metal and fastening devices.
- B. Shop Primed Ferrous Metals: Pre-treat and clean, spray apply one coat primer and bake.
- C. Enamel: Pre-treat to clean condition, apply one-coat primer and minimum two-coat epoxy baked enamel.
- D. Chrome/Nickel Plating: ASTM B456, Type SC 2 satin finish.
- E. Stainless Steel: No. 4 satin luster finish.
- F. Back paint components where in contact with building finishes helping resist electrolysis.

## 2.7 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.
- B. VOC Content: Determine VOC content of solvent borne, water borne paints and related coatings per EPA method 24 or ASTM D3960.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install toilet accessory units according to manufacturers' instructions, using fasteners appropriate to substrate as recommended by unit manufacturer. Install units plumb and level, firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, according to Manufacturer's instructions for type of substrate involved.
- C. Install grab bars to withstand a downward load of at least 250 lbf, complying with ASTM F446.

- D. Provide all items and accessories as required for a complete and total installation in every respect, whether or not specified or indicated on the drawings.

3.2 ADJUSTING AND CLEANING

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces strictly according to manufacturer's recommendations after removing temporary labels and protective coatings.

3.3 SCHEDULE

- A. The following schedule is based on products manufactured by Bobrick except as otherwise indicated.
- B. Refer to symbols on Drawings.

SYMBOL	CATALOG	DESCRIPTION
1	Tork 774728	Paper Towel Dispenser Black Plastic Surface Mount 12-1/2" high x 11-3/4" wide x 7-3/4" deep
2A	B-35643	Waste Receptacle Trim Line Series Recess Mount 40-1/16" high x 17-5/16" wide x 4" deep
2B	B-3644	Waste Receptacle Classic Series Recessed 40-1/16" high x 16" wide x 4" deep, 18 gal, Part No. 368560 with Part No. 368-16
2C	B-279	Waste Receptacle Surface Mount 18" high x 14" wide x 6" deep
3	GOJO 5155-06	Soap Dispenser Surface Mount
4	Tork 247549A	Toilet Tissue Dispenser Surface Mount Two Roll 13" high x 21-1/2" wide x 5-1/2" deep
5A	B-2908X1836	Mirror with Angled Stainless Steel Frame and Tempered Glass 18" wide x 36" high
5B	B-2908X2460	Mirror with Angled Stainless Steel Frame and Tempered Glass 24" wide x 60" high

5C	B-2908	Mirror with Angled Stainless Steel Frame and Tempered Glass Width of Wall less 8" see Elevation
6A	B-6806-36	Grab Bar, 1-1/2" diameter Peened Grip Horizontal Stainless Steel Straight with Concealed Mounting, 36" long
6B	B-6806-48	Grab Bar, 1-1/2" diameter Peened Grip Horizontal Stainless Steel Straight with Concealed Mounting, 48" long
7A	B-254	Sanitary Napkin Disposal Surface Mount 10-11/16" wide x 15-1/8" high x 4-1/16" deep
7B	B-354	Sanitary Napkin Disposal Partition Mount 11" wide x 15-1/2" high
8	B-221	Seat Cover Dispenser Surface Mounted 15-3/4" wide x 11" high x 2" deep
9A	Koala Care KB200-05	Child Care Changing Station Horizontal to Surface Mount 35" wide x 22" high x 4" depth (closed)
9B	Koala Care KB134-SSLD	Sanitary Liner Dispenser Recessed Mounted 9-3/4" wide x 18" high x 4-1/8" deep
10	B-298X24	Shelf, Stainless Steel Surface Mount 24" long x 8" wide
11	B-223X24	Mop Racks Surface Mount 24" wide x 5" high

C. General Notes

1. Soap Unit to be secured to wall above lavatory with two screws. Exact location shall be indicated by Architect at the time of installation. Coordinate the location of this dispenser so that no conflict occurs at either the wall mounted mirror above the lavatory or the cold water faucet assembly mounted on the deck of the lavatory.
2. One (1) mop holder shall be provided at each custodial sink and mounted at 60" AFF.

END OF SECTION 10 28 00



## SECTION 10 43 16 – FIRST AID CABINET

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Wall mounted first aid cabinet.

#### 1.3 SUBMITTALS FOR REVIEW

- A. Product Data: Provide UL listing/rating, insurance ratings, dimensions, and anchorage/installation instructions.

#### 1.4 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURES

- A. Manufacturer shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.

- 1. American First Aid Kits, Inc.

#### 2.2 COMPONENTS

- A. Cabinet; Model # 247-0
  - 1. Metal wall mount cabinet, 15-3/16" wide x 16-3/8" high x 5-13/16" deep.

2. Three (3) metal shelves

B. Components;

1. Manufacturers standard 941 piece first aid items.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

A. Verify existing site conditions.

#### 3.2 INSTALLATION

A. Install cabinet in accordance with manufacturer's instructions in the location shown on plans.

B. Provide all material, accessories, and labor to complete the installation.

END OF SECTION 10 43 16



## SECTION 10 44 00 – FIRE PROTECTION SPECIALTIES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Fire protection cabinets for portable fire extinguishers.
    - b. Portable fire extinguishers.
    - c. Fire extinguisher brackets.

#### 1.3 REFERENCES

- A. ASTM A568/A568M –Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
- B. Carbon Dioxide Types UL 154.
- C. Dry Chemical Types UL 299.
- D. Water Types UL 626.
- E. Halon Types UL 1093.
- F. UL 92 – Fire Extinguisher & Booster Hose.
- G. UL 711 – Rating and Fire Testing of Fire Extinguishers.
- H. NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems.
- I. Portable fire extinguishers used to comply with this standard shall be listed and labeled and meet or exceed all the requirements of Fire Test Standards UL 711.
- J. FFPC – Florida Fire Prevention Code.
- K. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated door hardware, cabinet type, trim style, and panel style. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets.
  - 1. Fire Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

- B. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required, prepared on samples of size 6 by 6 inches square.
- D. Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function. Use same designations indicated on drawings.
- E. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  - 2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  - 3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  - 4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- F. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
  - 1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  - 2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  - 3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  - 4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- C. Installer Qualifications: Shall be State of Florida certified.
- D. Conform to NFPA 10 requirements for all portable fire extinguishers and fire blankets.
- E. Provide fire extinguishers, cabinets, fire blankets, and accessories by single manufacturer.

- F. The identification of the listing and labeling organization, the fire test, and the performance standard that the fire extinguisher meets or exceeds shall be clearly marked on each fire extinguisher.

#### 1.6 FIELD CONDITIONS

- A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
- B. Coordinate sizes and locations of fire protection cabinets with wall depths.

#### 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguisher cabinets that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure of hydrostatic test according to NFPA 10.
    - b. Faulty operation of valves or release levers.
  - 2. Warranty Period: Five (5) years from date of Substantial Completion.

#### 1.8 PERFORMANCE

- A. Performance: Fire extinguishers shall be UL-rated, fully charged and ready for emergency use when applicable per the Florida Building Code, the Florida Fire Prevention Codes, NFPA 10 as adopted by the Florida State Fire Marshall Office and NFPA standards as adopted by the Florida State Fire Marshall Office.
- B. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. J. L. Industries, Inc., a division of Activar Construction Products Group.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Amerex Corporation
  - 2. Ansul Incorporated
  - 3. Larsen's Manufacturing Company

4. Potter Roemer LLC

2.2 LEGEND

- A. FEC – Fire Extinguisher Cabinet
- B. FE – Fire Extinguisher Bracket

2.3 EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each fire protection cabinet and mounting bracket indicated.
  - 1. Valves: Manufacturer's standard.
  - 2. Handles and Levers: Manufacturer's standard.
  - 3. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.
- B. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 2-A:10-B:C, 10 lb. nominal capacity in enameled steel tank with pressure gauge size and classification as scheduled. To be used at all locations unless noted otherwise.
- C. Stored-Pressure Water-Mist Type: WM-Series UL-rated 2-A:C, 2.5-gal. nominal capacity, with water in enameled-steel container; with pressure-indicating gauge. To be used in computer labs.
- D. Carbon Dioxide Type: UL 154, Stainless steel tank with pressure gauge size and classification as scheduled, or if not scheduled, provide 10-B:C, 10 lb. nominal capacity. To be used in electrical rooms.
- E. Provide additional types to comply with conditions.
- F. Extinguisher Finish:
  - 1. Multi-purpose Units: Provide heavy-duty, DOT steel cylinders with corrosion and impact resistant polyester/epoxy paint finish.
  - 2. Gaseous and wet chemical units: Provide stainless steel, satin chrome finish.

2.4 SEMI-RECESSED FIRE PROTECTION CABINET

- A. Basis of Design: "Architectural Series, Model 2409-6R"
- B. Cabinet Metal: Use a formed sheet steel, galvanized 18-gauge thick base metal.
- C. Configuration: Semi-recessed type, per drawing details and locations, sized to accommodate required extinguishers, combination fire extinguisher cabinet and accessories.
- D. Cabinet Trim Style: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

1. Exposed Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
  - a. Rolled Edge Trim: 2-1/2 inch backbend depth (semi-recessed) surface.
- E. Cabinet Trim Material: Manufacturer's standard, steel:
- F. Door Style: Manufacturer's standard design, vertical duo glazed panel with pull.
- G. Door Construction: Fabricate doors according to manufacturer's standards, of materials indicated, and coordinated with cabinet types and trim styles selected.
  1. Provide minimum 1/2 inch thick door frames, fabricated with tubular stiles and rails, and hollow metal design.
- H. Door: Formed steel, reinforced for flatness and rigidity.
- I. Door Glazing: Clear 1/8" thick tempered glass.
- J. Cabinet Mounting Hardware: Appropriate to cabinet and extinguisher size and weight.
- K. Form cabinet enclosure with right angle inside corners and seams.
  1. Form perimeter-trim and door stiles.
- L. Pre-drill the unit for anchors and accessories.
- M. Hinge doors for 180° opening with continuous piano hinge.
  1. Provide nylon self-adjusting roller catch.
  2. Provide recessed door pull.
- N. Glaze doors with resilient channel gasket glazing.
- O. Identification: Provide lettering to comply with authorities having jurisdiction for letter style, color, size, spacing, and location.
  1. Identify fire extinguisher in cabinet with the words "FIRE EXTINGUISHER" applied to door.
    - a. Location: Applied to cabinet door.
    - b. Application Process: Pressure-sensitive vinyl letters.
    - c. Lettering Color: Red.
    - d. Orientation: Vertical
- P. Fire Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.0428 inch thick, cold-rolled steel sheet lined with minimum 5/8" thick fire-barrier material. Provide UL Certification.

## 2.5 MOUNTING BRACKETS

- A. Wall and Cabinet Brackets: Shall be designed to fit extinguishers and shall hold extinguishers firmly and securely in place but shall provide for easy removal. Brackets shall be J. L. Industries "MARK" type.

- B. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.
- C. Identification: Provide 8" x 8" minimum plastic sign on the wall above the mounting bracket. Lettering shall comply with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
  - 1. Provide at hand held extinguishing units not in fire protection cabinets.
  - 2. Sign shall be fabricated with the words "FIRE EXTINGUISHER" in red letter letters applied to the white plastic sign surface.
    - a. Orientation: Horizontal.

## 2.6 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- B. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

## 2.7 FABRICATION

- A. Fire Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
  - 1. Weld joints and grind smooth.
  - 2. Provide factory-drilled mounting holes.
  - 3. Prepare doors and frames to receive handle.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
  - 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
  - 2. Miter and weld perimeter door frames.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.
- D. Brackets and cabinets shall be designed to prevent accidentally dislodging extinguisher and shall be size required for type and capacity of extinguisher indicated.

## 2.8 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces of fire protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

- C. Finish fire protection cabinets after assembly.
- D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- E. Steel Finishes
  - 1. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning" or SSPC-SP 8, "Pickling". After cleaning, apply a conversion coating suited to the organic coating to be applied over it.
  - 2. Baked-Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.
    - a. Cabinet Tub Color: White
    - b. Fire Extinguishers: Red
    - c. Door and Trim: White

## 2.9 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.

## PART 3 - EXECUTION

### 3.1 INSPECTION:

- A. Verify all rough openings, dimensions and clearances are the correct size and in the correct location prior to installation.
- B. Examine the areas and conditions of the work in this section.
  - 1. Correct conditions detrimental to timely and proper completion of the Work.
  - 2. Do not proceed until unsatisfactory conditions are correct.
- C. Verify servicing, charging and tagging of all fire extinguishers.
- D. Examine fire extinguishers for proper charging and tagging.
  - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Prepare recesses for fire protection cabinets as required by type and size of cabinet and trim style.

### 3.3 INSTALLATION

- A. General: Install fire protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights indicated below:
  - 1. Fire Protection Cabinets: 48 inches above finished floor to top of cabinet.
- B. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.
  - 1. Provide inside latch.
  - 2. Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.
- C. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
  - 1. Mounting Brackets: 54 inches above finished floor to top of fire extinguisher.
- D. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.
- E. Recharge existing fire extinguisher for units that are indicated to remain, replace if recharging is not possible.
- F. Provide occupancy hazard protection with fire extinguishers suitable for such Class A, B, C, D, or K fire potentials as might be present. Class K shall be provided in all food preparation areas.
- G. Install fire extinguishers in accordance with NFPA 10.
- H. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this section.
- I. Install cabinets plumb and level in wall openings in strict accordance with NFPA 10, the original design, the approved Shop Drawings and the manufacturer's recommended installation procedures as approved by the Architect and authorizing agencies, anchoring all components firmly into position for long life under hard use.
  - 1. Secure rigidly in place.
- J. Do not install extinguishers until Substantial Completion inspection date.
  - 1. Place extinguishers and accessories in cabinets or on wall brackets.
- K. Inspection tags shall be current as of the date of Substantial Completion and good for 1-year.

### 3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturers written installation instructions.
- B. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.



- C. On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.
- E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 44 00



## SECTION 10 51 21 – PLASTIC LAMINATE LOCKERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
  - 1. Plastic Laminate Lockers.
  - 2. A portion of Lockers shall be single tier, ADA compliant with recessed handles as indicated on drawings.

#### 1.3 REFERENCES

- A. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ANSI A117.1 – Safety Standards for the Handicapped.
- C. AWI – Architectural Woodwork Institute.
- D. NEMA (National Electric Manufacturer's Association) LD3 – High Pressure Decorative Laminates.
- E. Florida Building Code, Chapter 11: Florida Accessibility Code for Building Construction.
- F. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of locker.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of locker.
- B. Shop Drawings: For lockers.
  - 1. Include plans, elevations, sections, details, and attachments to other work.
  - 2. Show locker trim and accessories.
  - 3. Include locker identification system and numbering sequence.
- C. Samples: For each color specified, in manufacturer's standard size.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

- B. Sample Warranty: For special warranty.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- C. Regulatory Requirements: Where metal lockers are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG) and Florida Building Code 2001"
- D. Provide not less than 1 shelf located no higher than 54 inches above the floor for side reach.
- E. Provide hardware that does not require tight grasping, pinching, or twisting of the wrist, and that operates with a force of not more than 5 lb.

#### 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Full-size units of the following locker hardware items equal to ten (10) percent of amount installed for each type and finish installed, but no fewer than five (5) units:
    - a. Locks.
    - b. Identification plates.
    - c. Hooks.

#### 1.8 QUALITY ASSURANCE

- A. Installer Qualifications: when used with an entity, "experienced" means having successfully completed a minimum of 5 projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- 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. All parts and hardware shall be AWI compliant, structurally sound and free from defects, in material and workmanship under normal use and service for the full warranty period.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver lockers until spaces to receive them are clean, dry, and ready for their installation.

#### 1.10 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- C. During and after installation, maintain same temperature and humidity conditions in building spaces as will occur after occupancy.
- D. Protect locker finish and adjacent surfaces from damage.
  - 1. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that lockers can be supported and installed as indicated.

#### 1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures.
    - b. Faulty operation of latches and other door hardware.
  - 2. Damage from deliberate destruction and vandalism is excluded.
  - 3. Warranty Period for Lockers: Two (2) years from date of Substantial Completion.

#### 1.12 PERFORMANCE REQUIREMENTS

- A. Accessibility Requirements: For lockers indicated to be accessible, and if not indicated provide 5% and comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturer shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Hollman, Inc.

#### 2.2 LOCKER

- A. Locker Frame: Tops, sides, and back shall be constructed of 5/8" high-density industrial grade particle board core with plastic laminate.

- B. Type: Double tier, Model B: 1-Coat Rod, 1-Coat Hook
- C. Visible Edges: Sealed with a 1.5 mm PVC edge banding to closely match locker doors.
- D. Locker Doors:
  - 1. Laminate: 5/8 inch high density industrial grade particle board core with plastic laminate.
- E. Matching laminate applied to interior and exterior door face.
  - 1. Door edges sealed with eased edge 1.5 mm PVC edge banding to closely match laminate.
- F. Standard hardware:
- G. Number Disk: 1-1/2" Dia. flush mounted disc with 3/8" high contrast digits. US Block 1L font.
- H. Coat Rod: 1" Dia. recessed rod.
- I. Coat Hook: 2-prong metal hooks.
- J. Hinges: Soft-close, concealed, heavy duty European steel allowing 110 degree door opening with lifetime warranty.
- K. Size: 15"w x 20"d x 60"h.
- L. Locks: Centered vertically in door and spaced horizontally per lock type.
- M. Venting: 12 mm openings between door and top and bottom of locker and dividers on multiple opening frames provide continuous natural air flow.

## 2.3 MATERIALS

- A. Core Material:
  - 1. Particleboard: 5/8" and 3/4" noted and complying with ANSI A208.1 for High-Density Grade, Grade M-2-Exterior Glue.
- B. Adhesive: Water based low Volatile Organic Compound (VOC) Non-toxic, PVA adhesive.
- C. Laminates:
  - 1. Laminates shall be Class II B fire resistant rated.
  - 2. VGS (.028) NEMA LD 3 – Vertical Grade, High Pressure Decorative Laminate
  - 3. HGS (.048) NEMA LD 3 – Horizontal Grade, High Pressure Decorative Laminate
- D. Edges: PVC edge banding, 1.5thick, matching laminate in color.

## 2.4 FABRICATION

- A. Locker shall be fabricated using doweled and glued and nailed assembly process.

- B. Fabricate lockers square, rigid and without warp, with the finished faces flat and free of scratches and chips.
- C. Machine all parts and attachment holes accurately and without chips.

### PART 3 – EXECUTION

#### 3.1 EXAMINATION

- A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. General: Install lockers level, plumb, and true; shim as required, using concealed shims.
  - 1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent distortion.
  - 2. Anchor single rows of lockers to walls near top and bottom of lockers and to floor.
  - 3. Anchor back-to-back lockers to floor.
- B. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

#### 3.3 ADJUSTING

- A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding. Verify that locking devices operate properly.

#### 3.4 PROTECTION

- A. Protect lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.
- B. Touch up marred finishes, or replace lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 10 51 21





## SECTION 10 56 13 – METAL STORAGE SHELVING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Four post open shelving.

#### 1.3 REFERENCES

- A. ASTM A513, Type 2 – Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
- B. ASTM A1011/A1011M – Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- C. ASTM A1011/A1011M – Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, construction details, material descriptions, dimensions of individual components and profiles, and finishes for metal storage shelving.
- B. Shop Drawings: For customized metal storage shelving. Include plans, elevations, sections, details, and attachments to other work. Include installation details of connectors, lateral bracing, and special bracing.
- C. Samples for Initial Selection: For units with factory-applied color finishes. Include similar Samples of accessories involving color selection.
- D. Product Schedule: For metal storage shelving.
- E. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.

2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

F. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:

1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

#### 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 metal storage shelving from single source from single manufacturer.

#### 1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install metal storage shelving until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Coordinate sizes and locations of blocking and backing required for installation of metal storage shelving attached to wall and ceiling assemblies.
- C. Coordinate locations and installation of metal storage shelving that may interfere with ceiling systems including lighting, HVAC, speakers, sprinklers, access panels, electrical switches or outlets, and floor drains.

#### 1.7 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

## 1.8 PERFORMANCE REQUIREMENTS

- A. Structural Performance for Four-Post Metal Storage Shelving: Capable of withstanding the loads indicated according to MH 28.1.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer shall be one of the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Hallowell; Division of List Industries, Inc.
  - 2. Lyon Workspace Products, LLC.
  - 3. Penco Products, Inc.

### 2.2 MATERIALS

- A. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- C. Steel Tubing: ASTM A 513, Type 2.

### 2.3 FOUR-POST OPEN SHELVING

- A. Four-Post Open Storage Shelving: Factory-formed 14-gauge, field-assembled, freestanding system, designed for shelves to span between and be supported by corner posts, with shelves adjustable over the height of shelving unit.
- B. Fabricate initial shelving unit with a post at each corner.
- C. Provide fixed top and bottom shelves, three (3) adjustable intermediate shelves (for a total of five (5) shelves per unit), and accessories indicated.
- D. Load-Carrying Capacity per Shelf: 350 lb.
- E. Bracing: Manufacturer's standard, single or double diagonal cross bracing at back and ends; as required for stability, load-carrying capacity of shelves, and number of shelves.
- F. Solid-Type Shelves: Fabricated as required for load-carrying capacity per shelf. Fabricate fronts and backs of shelves with box-formed edges, with corners lapped and welded.
- G. Size: 36" wide by 12" deep by 72" high or as indicated on drawings.

## 2.4 FABRICATION

- A. Shop Fabrication: Prefabricate shelving components in shop to greatest extent possible to minimize field fabrication; temporarily preassemble shelving components where necessary to ensure that field-assembled components fit together properly. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Fabricate storage shelving square and rigid, with posts plumb and true and shelves flat and free of dents or distortion. Fabricate connections to form a rigid structure, free of buckling and warping.
  - 1. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
  - 2. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.
  - 3. Build in straps, plates, brackets, and other reinforcements as needed to support shelf loading.
  - 4. Cut, reinforce, drill, and tap metal fabrications to receive hardware, fasteners, and similar items.
- C. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- D. Form edges and corners free of sharp edges or rough areas. Fold back and crimp exposed edges of unsupported sheet metal to form a 1/2-inch- wide hem on the concealed side; ease edges of metal plate to radius of approximately 1/32 inch. Shear and punch metals cleanly and accurately. Remove burrs.
- E. Weld corners and seams continuously on cabinets to develop strength, minimize distortion, and maintain the corrosion resistance of base metals. At exposed locations, finish welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces before finishing.

## 2.5 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning" or SSPC-SP 8, "Pickling."
- D. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry thickness.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine floors for suitable conditions where metal storage shelving will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Vacuum finished floor and wet mop resilient flooring over which metal storage shelving is to be installed.

### 3.3 INSTALLATION

- A. Install metal storage shelving level, plumb, square, rigid, true, and with shelves flat and free of dents or distortion. Make connections to form a rigid structure, free of buckling and warping.
  - 1. Install exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
  - 2. Install braces, straps, plates, brackets, and other reinforcements as needed to support shelf loading and as required for stability.
  - 3. Adjust post-base bolt leveler to achieve level and plumb installation.
  - 4. Connect side-to-side and back-to-back shelving units together.
  - 5. Install shelves in each shelving unit at spacing indicated on drawings or, if not indicated, at equal spacing.
    - a. Four-Post Metal Storage Shelving: Install four clips, one at each post, for support of each shelf; with clips fully engaged in post perforations.

### 3.4 ERECTION TOLERANCES

- A. Erect four-post metal storage shelving to a maximum tolerance from vertical of 1/2 inch in up to 10 feet of height, not exceeding 1 inch for heights taller than 10 feet.

### 3.5 ADJUSTING

- A. Adjust metal storage shelving so that connectors and other components engage accurately and securely.
- B. Adjust and lubricate operable components to operate smoothly and easily, without binding or warping. Check and readjust operating hardware.
- C. Touch up marred finishes or replace metal storage shelving that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by metal storage shelving manufacturer.

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- D. Replace metal storage shelving that has been damaged or has deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 56 13

## SECTION 10 73 26 – WALKWAY COVERINGS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Aluminum walkway canopy system.
    - b. Accessories.

#### 1.3 REFERENCES

- A. ASTM B 209 – Specification for Aluminum and Aluminum- Alloy Sheet and Plate.
- B. ASTM B 221 – Specification for Aluminum and Aluminum- Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- C. ASTM C 150 – Specification for Portland Cement.
- D. ASTM C 404 – Specification for Aggregates for Masonry Grout.
- E. American Welding Society (AWS).
- F. ANSI/AWS D1.2 – Structural Welding Code - Aluminum.
- G. ASCE 7 – Wind Loads.
- H. ASTM B206 – Aluminum and Aluminum-Alloy Sheet and Plate.
- I. AAMA 611 – Voluntary Specification for Anodized Architectural Aluminum.
- J. AAMA 2603 – Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- K. AAMA 2604 – Voluntary Specification, Performance Requirements and Test Procedures for High Performing Organic Coatings on Aluminum Extrusions and Panels.
- L. AAM A 2605 – Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- M. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Submit manufacturers published product data for metal items being incorporated into the Work.
- B. Shop Drawings:

1. Submit customary and complete shop drawings for proposed miscellaneous metal items requiring shop fabrications.
  2. Shop Drawings shall consist of plans and elevations at not less than 1 inch to 1-foot scale and include details of sections and connections at not less than 3 inches to 1-foot scale.
  3. Show anchorage and accessory items. Show all expansion joint locations and details. Provide templates for anchor and bolt installation by others.
  4. Detail all anticipated mechanical joints and show locations on plans.
- C. Submit color samples of material finishes for Architect's selection.
- D. Delegated-Design Submittal: Submit design calculations, footing design, analysis data and shop drawings indicating compliance with dedicated design requirements signed and sealed by the qualified Florida registered professional engineer responsible for their preparation.
- E. Approvals: Manufacturer shall submit documentation that product complies with and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.
- F. Recycle: Submit manufacturer's documentation substantiating the following requirements for materials for each type provided under work of this section for recycled content:
1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
  2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
  3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
  4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
- G. Local/Regional Materials: Submit manufacturer's documentation substantiating the following requirements for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Not less than 20 percent of building materials (by cost) shall be regional materials. Unless otherwise indicated, submit the following for each type of product provided under work of this section for locations:
1. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
  2. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
  3. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
  4. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.
- 1.5 INFORMATION SUBMITTALS
- A. Installer's Certification from manufacturer.



1.6 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.
- C. System to be designed to provide positive drainage in all conditions.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products as instructed by manufacturer.
- B. Promptly inspect shipment to assure the products comply with requirements, quantities are correct, and products are undamaged.
- C. Stack the materials to prevent twisting, bending, or abrasion, and to provide ventilation.
  - 1. Slope metal sheets to ensure drainage.
- D. Prevent contact with materials during storage, which may cause discoloration or staining.

1.8 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's written warranty to repair or replace components of the system that fail within the indicated warranty period. Warranty shall include all costs for materials required to perform repairs.
  - 1. Warranty Period: Not less than two (2) years from Date of Substantial Completion.
- B. Installer's Warranty: Provide installer's written warranty to repair or replace components of the system that fail due to workmanship within the indicated warranty period. Warranty shall include all costs for and labor required to perform repairs.
  - 1. Warranty Period: Not less than two (2) years from Date of Substantial Completion.

1.9 PERFORMANCE

- A. Approvals: Manufacturer shall certify that product complies with and has been tested and approved in compliance with Florida Product Approval or Miami Dade NOA and applicable requirements.
- B. Delegated-Design: Provide delegated design services including calculations and shop drawings for load bearing items to comply with performance requirements, applicable code requirements and design criteria signed and sealed by an engineer registered in the State of Florida.
  - 1. Walkway covering manufacturer shall also design all required footings and reinforcing by Code and all connections in accordance with the Florida Building Code as part of the delegated-design.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Perfection Architectural Systems, Inc.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Architectural Metal Systems
  - 2. Dittmer Architectural Aluminum
  - 3. American Aluminum Products Company, Inc.
  - 4. Architectural Protective Covers
  - 5. Peachtree Protective Covers, Inc.

### 2.2 SYSTEM

- A. Work shall include the structural tubular aluminum beams, columns, canopy downspouts, and their placement within the concrete and masonry columns supporting the canopies.
- B. Water Drainage: Water shall drain internally from the deck into the beams into pre-determined columns for discharge into underground storm water drainage system unless indicated otherwise on the drawings.
  - 1. Above ground drainage discharge: Columns shall be provided with a radius-cornered cutout and internal diverter for drainage above ground. Circular downspout opening in column is not acceptable. Downspout columns shall be filled with grout below the diverter to prevent standing water. Provide where indicated on the drawings.
- C. Bent Construction: Beams and columns shall be welded into one-piece rigid bents in the factory. Extruded structural ties shall be installed rigidly on top of all beam sections and shall also serve as closures between draining deck sections. Bents shall have with downspouts, flange, anchors, sleeves, as required for a complete and working installation.
  - 1. Mechanical slip joints may be used for shipping purposes. Field weld seams after erection.
  - 2. Bents shall be 4 x 4 minimum and bents shall be 4 x 6 minimum.
- D. Roof Deck: Extruded roof deck sections shall be composed of interlocking and self-flashing sections. Self-flashing and interlocking joints shall be fastened rigidly with fastenings as shown on shop drawings.
  - 1. Deck: 3-inch high by 6-inch wide profile (nominal) minimum.
  - 2. Expansion Joints: Structure shall be designed for temperature changes of 120 degrees F with expansion joints provided if required. Expansion joints shall have no metal-to-metal contact.

- E. Beams: Provide open-top tubular extrusion. top edges thickened for strength and designed to receive deck members in self-flashing manner.
- F. Deck: Extruded self-flashing sections interlocking into a composite unit. Provide welded plate closures at deck ends.
- G. Fascia: Manufacturer's standard shape. Provide fascia splices where continuous runs of fascia are jointed. Locate splices to be in line with bents and fasten in place on hidden or non-vertical surfaces.
- H. Erection: In accordance with manufacturer's approved shop drawings. All bents shall be straight and true prior to placing concrete. Aluminum columns embedded in concrete shall be protected with 2 coats clear acrylic. Protect components from damage during installation and subsequent Work.
- I. Complete system shall be rigid frame with a water-tight internal drainage system.

## 2.3 MATERIALS

- A. Extruded Aluminum: ASTM B221 6063-T6 alloy, T6 Temper.
- B. Gaskets: Dry seal santoprene pressure type.
- C. All fasteners shall be 18-8 or 300 Series stainless steel (screws, bolts, rivets, etc.).
- D. Grout: Grout shall be 2000 P.S.I. minimum compressive strength.
- E. Gaskets: Gaskets shall be dry seal santoprene elastomer pressure type.

## 2.4 FABRICATION

- A. Beams and columns shall be factory welded with mitered corners into one-piece rigid bents.
  - 1. Welds shall be smooth and uniform using inert gas shielded arc, with 100% penetration.
  - 2. Grind welds only where interfering with adjoining structure to allow a flush connection.
- B. Field welding is not permitted, use rigid mechanical joints when shipping limitations exist.
- C. Deck shall be roll formed modules that interlock to form a self-flash condition.
  - 1. Positively fasten interlocking joints to form a monolithic structural unit to develop the full strength of the sections.
  - 2. Assemble the deck with sufficient camber to offset dead load deflection.

## 2.5 FINISH

- A. Aluminum Surfaces: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.

- B. Aluminum Surfaces: Sections shall be free of scratches and other serious surface blemishes and chemically cleaned.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. High-Performance Organic Finish Two-Coat Fluoropolymer: Chemical Finish Organic Coating, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight. Complying with paint manufacturer's written instructions for cleaning, preparing, pretreating and apply coating to exposed metal surfaces to comply with AAMA 2604.
  - 1. Color and Gloss: As selected by Architect from full range of industry colors and color densities.

## 2.6 ENVIRONMENTAL

- A. Recycled Content: Provide products with an average recycled content of metal products so 100% of postconsumer recycled content plus 50% of preconsumer recycled content is not less than 20 percent.

## PART 3 - EXECUTION

### 3.1 INSPECTION, PREPARATION, AND INSTALLATION

- A. Canopy manufacturer shall examine surfaces prior to the start of installation. Deviations from the approved shop drawings shall be brought to the attention of the Contractor at once.
- B. Aluminum surfaces that are to come in contact with dissimilar materials shall be protected with one coat of asphaltic emulsion paint in addition to factory protection.
- C. Erection of the canopies shall be completed by an installer approved by the manufacturer in accordance with approved shop drawings.
- D. Only specialized mechanics having at least two (2) years experience in this type of work shall be employed in the erection of the canopies.

END OF SECTION 10 73 26

## SECTION 11 31 00 – RESIDENTIAL APPLIANCES

### PART 1 – GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Appliances
    - b. Provide accessories and necessary mechanical and electrical connections as shown on the plans, specified, and as required for complete operating systems.

#### 1.3 REFERENCES

- A. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Submit shop drawings and manufacturer literature including the model number, material, finishes, and details of construction and installation.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Certificates: For each type of appliance.
- C. Field quality-control reports.
- D. Sample Warranties: For manufacturers' special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Certification Labels: Provide residential appliances which complies with standards and bears certification labels as follows:
  - 1. Energy Ratings: Provide energy guide labels with energy cost analysis (annual operating costs) and efficiency information as required by Federal Trade Commission.
  - 2. UL Standards: Provide residential appliances with UL labels.
  - 3. Uniformity: Provide residential appliances by single manufacturer to the greatest extent possible for the entire project.
- B. An installer who has a minimum of five (5) years experience in the field, and can demonstrate successful completion of similar projects must perform installation of specified work.
- C. Electrical Appliances: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- D. UL and NEMA Compliance: Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable NEMA standards.
- E. AGA and ANSI Standards: Provide gas-burning appliances that carry the design certification seal of AGA and that comply with ANSI Z21-Series standards.
- F. AHAM Standards: Provide appliances that comply with the following AHAM standards.

1.8 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranties: Written warranties, executed by manufacturer of each appliance specified agreeing to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
  - 1. Electrical Range: Five (5) year limited warranty for in-home service on surface-burner elements.
  - 2. Refrigerator/Freezer: Five (5) year limited warranty on the sealed refrigeration system.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer shall be one of the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding:
  - 1. General Electric
  - 2. Hotpoint
  - 3. LG Electronics
  - 4. Maytag
  - 5. Speed Queen
  - 6. Whirlpool
  - 7. Insinkerator
- B. All products shall be ADA compliant and installed to meet code requirement.

## 2.2 MATERIALS

- A. The use of Energy Star products is required over non-energy star product when available.
- B. Provide appliance in the number, location, and type shown on the plans and from the Residential Equipment Schedule acceptable standards.

## 2.3 ACCESSORIES

- A. Provide all ductwork, termination caps, and accessories as required by each manufacturer to complete the install of each unit as shown on the drawings.
- B. Coordinate electrical accessories required for complete installation.

## 2.4 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining 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 substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.

- C. Examine walls, ceilings, and roofs for suitable conditions where overhead exhaust and microwave ovens with vented exhaust fans will be installed.
- D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install appliances according to manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.

### 3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
  - 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
  - 2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
  - 3. Operational Test: After installation, start units to confirm proper operation.
  - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

END OF SECTION 11 31 00



RESIDENTIAL EQUIPMENT SCHEDULE

ITEM NO.	SOURCE	CAT. NO.	DESCRIPTION	DIVISION 23 – MECHANICAL FIELD CONNECTION	DIVISION 26 – ELECTRICAL FIELD CONNECTION	NOTE REF.
REF	FRIGIDIARE	FGH12164QF	TOP-FREEZER REFRIGERATOR	C WATER	120V, 60 HZ; 15 AMP	
DWSH	FRIGIDAIRE	FGID2476SF	DISH WASHER	H/C WATER	120V, 60 HZ; 15 AMP	

Verify and coordinate electrical requirements



## SECTION 11 51 19 – BOOK THEFT PROTECTION EQUIPMENT

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Electrically book theft protection equipment.
    - b. Accessories.

#### 1.3 REFERENCES

- A. NFPA 70 – National Electric Code.
- B. UL – Underwriters Laboratories, Inc.
- C. ANSI A11.7.1 – Safety Standards for the Handicapped.
- D. ADA Accessibility Guidelines (ADAAG).
- E. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Shop drawings showing layout. Show the following:
  - 1. Indicate the model number, finishes, and details of construction and attachment.
  - 2. Location of wiring connections.
  - 3. Anchorage details.
  - 4. Accessories.
- B. Sample Warranties

#### 1.5 QUALITY ASSURANCE

- A. Coordination of Work: Coordinate layout and installation of equipment with other construction.
- B. Contractor's Qualifications: Employ only experienced Contractors (Installers) skilled in the successful installation of the specified materials and assemblies on similar projects for a minimum of five years. Installers shall be state-certified or licensed Sub-Contractors, or locally registered Sub-Contractors.

1. Installer shall be trained and certified by manufacturer of book theft protection equipment. Proof of training shall be required.
- C. Manufacturer's Qualifications: Employ only manufacturers making the specified materials as a current catalog and regular production item for ten (10) years.
- D. Pre-Construction Conference: Before the start of equipment installation, the Installer shall meet with equipment representatives from OCPS, the Contractor and Architect for the purposes of discussing exact locations, electrical conduit, power locations and connections prior to concrete slab placement.
- E. Field verify locations of required electrical connections.
  1. Service of Book Theft Protection Equipment
    - a. Service response time shall be maximum of 4 hours for call-back to Owner and 8 hours to on-site resolution of service issue. A 1-800 number shall be available to Owner to request service calls on a 24/7 time frame.
    - b. Service personnel shall carry all main parts within service vehicle to ensure quick resolution of service related problems.

#### 1.6 WARRANTY

- A. This Contractor shall fully guarantee all materials and labor under this section for a period of not less than 1-year from date of final acceptance of the building against all defects in both workmanship and materials, and he shall promptly correct and/or replace such faulty work if so notified.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver equipment until building is enclosed, other construction within spaces where equipment will be installed is substantially complete, and installation of equipment is ready to take place.
- B. Protect equipment from damage during delivery, handling, storage, and installation.
- C. Store equipment in manufacturer's protective packages in a position that complies with equipment manufacturer's directions. Keep equipment in manufacturer's protective packages until time of installation.
- D. Protect surfaces of equipment from damage due to abrasion, dust, and other conditions.

#### 1.8 PERFORMANCE

- A. The radio frequency (RF) transceiver antennas shall use digital signal processing to ensure detection rates in the 90+ % range, at a spread of 71 inches between antennas, and 30 inches to each side of each transceiver antenna.
- B. Mounting Options: Buried cable, direct mounting to the floor surface using ADA approved base plate system, as indicated by the Architect.

- C. Antennas shall be of solid oak construction, supplied finished or unfinished to meet the specific needs of the media center environment and have the ability to be stained to match wood selection in media center.
- D. All components of the system and the system as a whole shall be UL compliant and approved, a UL file number shall be available upon request as proof of the requirement.
- E. Tolerance from wall or door shall be 9 inches from the transceiver's outer shell.
- F. The system shall use advanced filtering algorithms to maximize alarm integrity.
- G. The RF transceiver system shall be guaranteed to work with the Checkpoint manufactured tags existing currently in OCPS media items. A test of this requirement may be asked for to ensure systems work with existing (single) tags to 90% or better pick rate.
- H. Transceiver antennas shall be at least 64.7 inches high and have individual alarms for each antenna.
- I. The RF transceiver system shall use pulse listen technology, not swept technology.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Basis of Design Product: Subject to compliance with requirements provide the following manufacturer.
  - 1. 3M
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Demco
  - 2. Gaylord
  - 3. Brodart Supplies & Furnishings

### 2.2 BOOK THEFT PROTECTION EQUIPMENT

- A. Basis of Design: Liberty PX
- B. Fabrication: Textured, molded-through color, impact resistant SMC plastic frame with an impact resistant injection molded SMC plastic.
- C. Detection System: Radio frequency (RF) detection system with manufacturer "Digital Signal Processing" (DSP) detection technology.
- D. Accessories: Electronic Tags (Each System): 1 roll of 2000 Checkpoint 9.5 frequency – RF Series 320 plain tags and 1000 detuning Check Cards (white-grid style).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate all under slab infrastructure with location of equipment.

3.2 INSTALLATION

- A. Install equipment in accordance with the manufacturer's printed instructions, drawings and specifications, and approved shop drawings.
- B. Manufacturers' Installer shall inspect under-slab infrastructure work to ensure completeness of work to receive book security equipment.
- C. Work under this Section shall include demonstrating the proper use and operation of equipment to the Owner as may be required.
- D. Provide all items and accessories as required for a complete and total installation in every respect.

END OF SECTION 11 51 19

## SECTION 11 52 13 – PROJECTION SCREENS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, material, services and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Manually operated, wall mounted, front projection screens.

#### 1.3 REFERENCES

- A. ASTM G21 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. NFPA 255 – Standard Test Methods of Surface Burning Characteristics of Building Materials.
- D. UL – Underwriters Laboratories.
- E. FBC – Florida Building Code.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show layouts and types of front-projection screens. Include the following:
  - 1. Drop lengths.
  - 2. Location of seams in viewing surfaces.
  - 3. Location of screen centerline relative to ends of screen case.
  - 4. Anchorage details, including connection to supporting structure for suspended units.
  - 5. Details of juncture of exposed surfaces with adjacent finishes.
  - 6. Accessories.
- C. Samples for Initial Selection: For finishes of surface-mounted screen cases.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.

- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Environmental Limitations: Do not deliver or install front-projection screens until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Protect screens from damage during delivery, handling, storage, and installation.
- C. Store projection screens in manufacturer's protective packages in a position that complies with screen manufacturer's directions. Keep units in manufacturer's protective packages until time of installation.
- D. Protect surfaces of projection screens from damage due to abrasion, dust, and other conditions.

#### 1.7 FIELD CONDITIONS

- A. Coordination of Work: Coordinate layout and installation of projection screens with adjacent construction, including ceilings systems, light fixtures, HVAC equipment, fire-suppression system, and partitions.

#### 1.8 PERFORMANCE

- A. Mildew-Resistance Rating: Zero or 1 when tested according to ASTM G 21.
- B. Flame Resistance: Passes NFPA 701.
- C. Flame-Spread Index: Not greater than 75 when tested according to ASTM E 84.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURER

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Da- Lite Screen Company, Inc.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Draper Screen Company, Inc.
  - 2. Bretford, Inc.



3. Knox Manufacturing Co.

## 2.2 PROJECTION SCREENS

- A. Material and Viewing Surface of the Front Projection Screens: Provide screens manufactured from mildew and flame resistant fabric of type indicated for each type of screen specified and complying with the following requirements:
1. Material: Vinyl coated glass fiber fabric.
  2. Matte-White Viewing Surface: Peak gain of not less than 0.9, and gain of not less than 0.8 at an angle of 50 degrees from the axis of the screen surface.
  3. Mildew Resistance: Provide mildew resistant screen fabrics as determined by FS 191A/5760.
  4. Seams: Where length of screen indicated exceeds maximum length produced without seams in fabric specified, provide screen with horizontal seam placed as follows:
    - a. At top of screen at juncture where maximum length viewing surface is exceeded.
  5. Seamless Construction: Provide screens less than 84 inches by 84 inches without seams.
  6. Seams: Where length of screen indicated exceeds maximum length produced without seams in material specified, provide screen with horizontal seam placed as follows:
    7. At top of screen at juncture between extra drop length and viewing surface
  8. Edge Treatment: Black masking borders.
  9. Provide extra drop length of dimension indicated to comply with the following requirements for fabric color and location of drop length:
    - a. Color: Black.
    - b. Location: At top of screen.
    - c. Length: 3'-0"

## 2.3 MANUAL SCREENS

- A. Manually Operated Screens: Provide manufacturer's standard spring roller operated units designed and fabricated for wall installation and consisting of case, screen, mounting accessories, and other components necessary for a complete installation.
1. Basis of Design: "Model C" Wall Mounting
  2. Screen Case: Fabricated in 1 piece from steel sheet not less than 0.0299 inch, with flat back design and vinyl covering or baked enamel finish. Provide end caps with integral roller brackets and universal mounting brackets, finished to match end caps, for wall or ceiling mounting with factory baked finish.
  3. Screen Mounting: Top edge securely anchored to a 3 inch diameter, rigid steel spring roller; bottom edge formed into a pocket holding a tubular metal slat, with ends of slat protected by plastic caps, and saddle and pull, attached to slat by screws.
  4. Wall Mounting: Provide manufacturers standard wall mount bracket to position projection screen 6" from wall where indicated.
  5. Type: Model C with CSR 130D 69 x 110 MW.
    - a. (SC-1): 65" x 104" x 123" diagonal
    - b. (SC-2): 69" x 110" x 130" diagonal

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install front-projection screens at locations indicated to comply with screen manufacturer's written instructions.
- B. Install front-projection screens with screen cases in position and in relation to adjoining construction indicated. Securely anchor to supporting substrate in a manner that produces a smoothly operating screen with vertical edges plumb and viewing surface flat when screen is lowered.

#### 3.2 INSPECTION

- A. Inspect all screens for dirt, damage, and blemishes.
- B. Replace screens or units that do not perform as intended.

END OF SECTION 11 52 13

## SECTION 12 24 13 – ROLLER WINDOW SHADES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Manual operated roller shade with single rollers.
  - 2. Manual operated roller shade with double rollers.

#### 1.3 REFERENCES

- A. NFPA 701 – Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
- B. ANSI/WCMA A100 – American National Standard for Safety of Window Covering Products.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, styles, and operating and maintenance instructions for roller shades.
- B. Shop Drawings: Show plans, elevations, sections, installation details, operational clearances, fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.
- C. Samples: For each exposed product and for each color and texture specified, 10 inches long.
  - 1. Shadeband Material: Not less than 10 inches square. Mark interior face of material if applicable.
  - 2. Roller Shade: Full-size operating unit, not less than 16 inches wide by 36 inches long for each type of roller shade indicated.
  - 3. Installation Accessories: Full-size unit, not less than 10 inches long.
- D. Product Data: Submit manufacturer's product data, installation instructions and general recommendations for each specified material and fabricated product. Unless otherwise indicated, submit the following for each type of product provided under work of this section for recycled content:
  - 1. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.

2. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
3. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
4. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

E. Paints, primers, coatings and adhesives for or site installation or factory fabrication:

1. Submit manufacturer's product data for paints, primers, coatings and adhesives as indicated.
2. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
3. Submit manufacturer's certification that products comply with VOC limits when calculated according to 40CFR 59, Subpart D (EPA Method 24).

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of shadeband material.

C. Product Test Reports:

1. Fire-Test-Response Characteristics: Passes NFPA 701-99 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.
2. Anti-Microbial Characteristics: 'No Growth' per ASTM G 21 results for fungi ATCC9642, ATCC 9644, ATCC9645

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Roller Shades:
  - a. Fabric equal to 5 percent of quantity installed for each color, and shadeband material indicated.
  - b. Brackets equal to 5 percent of quantity installed for each type on project.

1.8 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Provide products from a firm that makes the indicated products as a regular production item and with not less than ten (10) years experience.

B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation of specified materials and assemblies with not less than five (5) years experience.

- C. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.
- D. NFPA Flame-Test: Passes NFPA 701. Materials tested shall be identical to products proposed for use.

#### 1.9 MOCKUPS

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
  - 1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
  - 3. Mock ups to remain in place through completion of work or to be archived by General Contractor to serve as an objective standard of work.
  - 4. Mock ups requested by architect shall be paid for by Owner.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.
- B. Do not deliver window shades until building is enclosed and construction within spaces where shades will be installed is substantially complete.
- C. Label containers and shades according to Window Shade Schedule.
- D. Store products in manufacturer's unopened packaging until ready for installation.

#### 1.11 FIELD CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Install roller shades after finish work and ambient temperature, humidity and ventilation conditions are maintained at levels recommended for project upon completion.

1.12 WARRANTY

- A. Roller Shade Hardware and Shadecloth: Manufacturer's standard non-depreciating twenty-five (25) year limited warranty.
- B. Roller Shade Installation: One year from date of substantial completion, not including scaffolding, lifts and other means of access.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer and basis of design shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product and acceptance is provided by the Architect in writing prior to bidding.
  - 1. Draper, Inc.
- B. The following manufacturers are acceptable provided they equal or exceed the material requirements and functional qualities of the basis of design product.
  - 1. Mechoshade Systems, Inc.
  - 2. Insoltroll Window Shading Systems
  - 3. SWF Contract

2.2 MANUALLY OPERATED SHADES WITH SINGLE-ROLLERS (SH-1, Light Filtering), (SH-2, Light Blocking)

- A. Basis of Design: "Clutch-Operated Flexshade" Light Filtering or Light Blocking as indicated.
- B. Manually Operated Window Shades with Independent Control: Manually operated, vertical roll-up, fabric window shade with components necessary for complete installation.
  - 1. Operation: Bead chain and clutch operating mechanism allowing shade to stop when chain is released. Designed never to need adjustment or lubrication. Provide limit stops to prevent shade from being raised or lowered too far.
    - a. Clutch mechanism: Fabricated from high carbon steel and molded fiberglass reinforced polyester or injected molded nylon. Minimum 20 lb. lifting capacity. Color as selected by Architect.
    - b. Bead chain loop: Stainless steel bead chain hanging at side of window.
    - c. Idler Assembly: Provide roller idler assembly of molded nylon with adjustable or spring-loaded length idler pin to facilitate easy installation, and removal of shade for service.
    - d. Bead Chain Hold Down: Spring-Loaded Tensioner complies with ANSI/WCMA A100.1-2018 safety standard.
  - 2. Single Roller Configuration:
    - a. Mounting:
      - 1) Ceiling/Wall Style Headbox.
    - b. Brackets: Plated stamped steel. Provide size compatible with roller size.
      - 1) Mounted to window head.

- c. Endcaps: Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size.
    - 1) Endcap covers: To match fascia or headbox color.
  - d. Fascia: L shaped aluminum extrusion to conceal shade roller and hardware.
    - 1) Attachment: Snaps onto endcaps without requiring exposed fasteners of any kind. Fascia can be mounted continuously across two or more shade bands. No notching is required.
    - 2) Shape: Square Fascia Panel.
    - 3) Color: As selected by the Architect.
  - e. Headbox Ceiling/Wall style: Aluminum fabrication with removable closure, endcaps, and back and top cover piece:
    - 1) Color: As selected by the Architect.
3. Roller Tube: Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Minimum roller diameter 1.5 inches. Fabric connected to the roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal. Adhesive attachment to eliminate horizontal impressions in fabric.
4. Shade Slat: Selected by the Architect.
5. Light Gap Reduction Channels.
- a. Aluminum L Angle – 3/4 inch by 1 inch at light filtering shades.
  - b. U Channel -1 inch by 2-1/2 inches at light blocking shades.
  - c. H Channel – 1 inch by 5 inches at light blocking shades.

### 2.3 MANUALLY OPERATED SHADES WITH DOUBLE ROLLERS (SH-3)

- A. Basis of Design: "Clutch-Operated Flexshade" Light Filtering and Light Blocking
- B. Manually Operated Window Shades with Independent Control: Manually operated, vertical roll-up, fabric window shade with components necessary for complete installation.
  - 1. Operation: Crank and gearbox.
    - a. Single shade.
    - b. Multiple shades.
    - c. Gear box: Die cast aluminum and steel construction. Injection molded nylon and steel crank insert installed in roller to engage gear box.
    - d. Crank handle.
      - 1) Detachable anodized aluminum and chrome plated steel handle.
      - 2) Size: 4 feet -verify with Architect.
    - e. Idler Assembly: Provide roller idler assembly of molded nylon with adjustable length idler pin to facilitate easy installation, and removal of shade for service.
  - 2. Dual Roller Configuration.
    - a. Mounting.
      - 1) Dual roller fascia. Endcaps with fascia designed for surface mounting of dual roller window shades.
        - (a) Mounted to window head.
        - (b) Endcaps: 1028 steel stamping.
        - (c) Fascia: L-shaped cover of extruded aluminum, .060 wall. Assembly snaps onto endcaps without exposed fasteners.
        - (d) Size: 4-3/4 inches deep x 7 inches high x length required by window opening.
        - (e) Color: As selected by the Architect.
          - (1) Clear Anodized
          - (2) Black

- (3) White
  - (4) Ivory
  - (5) Bronze
3. Roller Tube: Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Minimum roller diameter 1.5 inches. Fabric connected to the roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal. Adhesive attachment to eliminate horizontal impressions in fabric.
  4. Shade Slat: As selected by the Architect.
  5. Light Gap Reduction Channels.
    - a. Aluminum L Angle – 3/4 inch by 1 inch at light filtering shades.
    - b. U Channel – 1 inch (25 mm) by 2-1/2 inches at light blocking shades.
    - c. H Channel – 1 inch (25 mm) by 5 inches at light blocking shades.

## 2.4 SHADEBAND MATERIALS

- A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Identify products with appropriate markings of applicable testing agency.
- B. Final light filtering and light blocking fabric shall be as selected by the Architect from manufacturer's full range.

## 2.5 ROLLER-SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
  1. Inside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
  2. Provide multi-band shades to provide the maximum allowable width to accommodate operation by a single unit.
- C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible except as follows:
  1. One batten seam will be required for stability on shades taller than fifteen feet to be placed as indicated by Architect.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Proceed with installation only after unsatisfactory conditions have been corrected.



### 3.2 ROLLER-SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions on inside face of mullion unless indicated otherwise.
  - 1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.
- B. Main Contractor shall coordinate with requirements of roller shade installer/dealer, before inaccessible areas are constructed.

### 3.3 ADJUSTING

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

### 3.4 CLEANING AND PROTECTION

- A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 12 24 13



## SECTION 12 36 63 – QUARTZ COUNTERTOPS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
    - a. Quartz agglomerate countertops.
    - b. Accessories.

#### 1.3 REFERENCES

- A. FBC – Florida Building Code.
- B. ASTM International.
  - 1. ASTM C97 – Absorption and Bulk Specific Gravity of Dimension Stone.
  - 2. ASTM C99 – Modulus of Rupture of Dimension Stone.
  - 3. ASTM C170 – Compressive Strength of Dimension Stone.
  - 4. ASTM C217 – Weather Resistance of Slate.
  - 5. ASTM C482 – Bond Strength of Ceramic Tile to Portland Cement.
  - 6. ASTM C484 – Thermal Shock Resistance of Glazed Ceramic Tile.
  - 7. ASTM C501 – Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.
  - 8. ASTM C531 – Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
  - 9. ASTM C880 – Flexural Strength of Dimension Stone.
  - 10. ASTM C1026 – Resistance of Ceramic Tile to Freeze-Thaw Cycling.
  - 11. ASTM C1028 – Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
  - 12. ASTM C1243 – Relative Resistance to Deep Abrasive Wear of Unglazed Ceramic Tile by Rotating Disc.
  - 13. ASTM D256 – Izod Pendulum Impact Resistance of Plastics.
  - 14. ASTM D2047 – Static Coefficient of Friction of Polish-Coated Floor Surfaces by the James Machine.
  - 15. ASTM E84 – Surface Burning Characteristics of Building Materials.
  - 16. ANSI Z124.6 – Stain Resistance.
  - 17. ANSI/N 42.14 – Radiation.

1.4 ACTION SUBMITTALS

- A. Products: Include manufacturer's product specifications standard details and general recommendations, as applicable to materials.
- B. Shop Drawings: Indicate profiles of units, jointing, fastening, edge treatments, and related items.
- C. Samples: Submit the following:
  - 1. Submit full range of available colors and aggregates for selection purposes for Architect's selection. After initial selection, two sets, minimum 4" x 4", for each color for acceptance before proceeding with Work.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Manufacturer who fabricates quartz surfacing fabrications similar to work of this Project and have a minimum five (5) years experience.
- B. Qualifications: Manufacturer shall be ISO 9002 and ISO 14001 certified.

1.6 MOCK-UPS

- A. Construct one mock-up of typical countertop shown on Drawings. Approved mock-up can remain as completed work.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of construction to receive countertops by field measurements before fabrication.
- B. Coordinate locations of utilities that will penetrate countertops or backsplashes.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Handle, transport, and store units to prevent damage to materials or structure. Handle with care to prevent damage to corners and scratches to faces.
- B. Field measurements: Verify dimensions of construction to receive terrazzo countertops by field measurements before fabrication.

1.9 WARRANTY

- A. Warrant product to be free from defects in materials for a period of 10 years from date of installation.
- B. Warranty does not include scratching, chipping or staining by others following installation.

1.10 PERFORMANCE

- A. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E 84) or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Flame Spread Index: 25 or less.
  - 2. Smoke Developed Index: 450 or less.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer shall be the following however products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product.
  - 1. U.S. Quartz Products, Inc.

2.2 MATERIAL

- A. Basis of Design: "Caesarstone Quartz Surfacing"
- B. Composition: Crushed quartz aggregate combined with resins and pigments and fabricated into homogeneous slabs using a vacuum vibro-compaction process.
- C. Dimensions
  - 1. Thickness: 1-1/4"
  - 2. Size: Slabs shall be not less than 56.5 inches by 120 inches long to minimize the number of joints used in installation.
- D. Identification: Material shall be labeled with a batch number and imprinted with a manufacturer's identifying mark on the back.
- E. Color and Finish: See Drawings for selection.
- F. Exposed Edges and Corners Shapes: As selected by the Architect.
- G. Seam Width: <1/8"
- H. Sink Mounting: Under mount or as indicated on drawings.
- I. Backsplash: 4" high or as indicated on drawings.

2.3 ACCESSORIES

- A. Stone Adhesive

1. Provide epoxy or polyester adhesive of type recommend by manufacturer for application and conditions of use.
  2. Sink/bowl mounting hardware:
    - a. Manufacturer's approved bowl clips, brass inserts and fasteners for attachment of undermount sinks/bowls.
  3. Color: Adhesive that will be visible in finished work should be tinted to match quartz surfacing.
- B. Joint Sealants: Clear silicone sealant as recommended by manufacturer for application and per conditions of use.
- C. Solvent: Product recommended by adhesive manufacturer to clean surface of quartz surfacing to assure adhesion of adhesives and sealants.
- D. Cleaning Agents: Non-abrasive, low pH cleansers.

## 2.4 FABRICATION

- A. Shop Assembly: Observe proper safety procedures and comply with manufacturer's instructions.
- B. Layout: Layout joints to minimize joints.
- C. Inspect Material
1. Inspect material for defects prior to fabrication.
  2. Color Match
    - a. Materials used throughout the project shall be from the same batch and bear labels with the same batch numbers.
    - b. Visually inspect materials to be used for adjacent pieces to ensure acceptable color match.
    - c. Inspect in lighting conditions similar to those existing at the jobsite.
  3. Variation in distribution of aggregates in quartz surfacing that is within manufacturer's tolerances is not a defect.
- D. Provide 1-1/2" thick solid support brackets as indicated on the plan. Fabricate from two 3/4" thick pieces of material adhered back to back to provide finish surface on both exterior sides.
- E. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
- F. Form joints between components using manufacturer's standard joint adhesive joints.
1. Reinforce as required.
- G. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
- H. Rout and finish component edges and sink cutouts with clean, sharp returns.
1. Rout cutouts, radii and contours to template.
  2. Smooth and polish edges.
- I. Allowable Tolerances

1. Variation in component size  $\pm 1/8"$  over a ten (10) foot length.
2. Location of openings:  $\pm 1/8"$  from indicated location.
3. Maximum  $1/8"$  clearance between quartz surfaces and each wall.

- J. Fabricate cutouts for undercounter sinks as indicated.
- K. Fabricate integral backsplashes and side splashes as indicated.

## 2.5 FINISHING

- A. Polish edges where they will be exposed in finished work.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions and proceed with work in accordance with specifications.
- B. Confirm that supporting construction is complete, and is level, square, true, rigid, and secure.

### 3.2 INSTALLATION

- A. Install components plumb and level, in accordance with approved shop drawings and product installation details.
1. Flat and true to within  $1/8"$  of a flat surface over a 10' length.
  2. Allow a minimum of  $1/16"$  to a maximum of  $1/8"$  clearance between surface and each wall.
- B. Provide product in the largest pieces available.
- C. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
1. Exposed joints/seams shall not be allowed.
- D. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.
- E. Cut and finish component edges with clean, sharp returns.
- F. Rout radii and contours to template. Seal edges of cutouts in plywood by saturating with varnish.
- G. Anchor securely to base cabinets or other supports.
- H. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.
- I. Carefully dress joints smooth, remove surface scratches and clean entire surface.
- J. Applied backsplashes and applied sidesplashes:

1. Install using manufacturer's standard color-matched silicone sealant.

K. Form field joints using manufacturer's recommended adhesive, with joint widths no greater than 1/8" in finished work.

1. Keep components and hands clean when making joints.

L. Sinks:

1. Adhere undermount sinks/bowls to countertops using manufacturer's recommended adhesive and mounting hardware.

### 3.3 CLEANING

A. General: Comply with Specifications.

1. Keep installed work clean as work progresses.
2. Leave clean and free from blemishes.
3. Clean by moderate use of a ph balanced neutral cleaner acceptable by manufacturer.
4. Clean and repair surfaces soiled or otherwise damaged in connection with work of this section.
5. Sealer Application: Apply sealer to countertop to comply with sealer manufacturer's instructions.

END OF SECTION 12 36 63