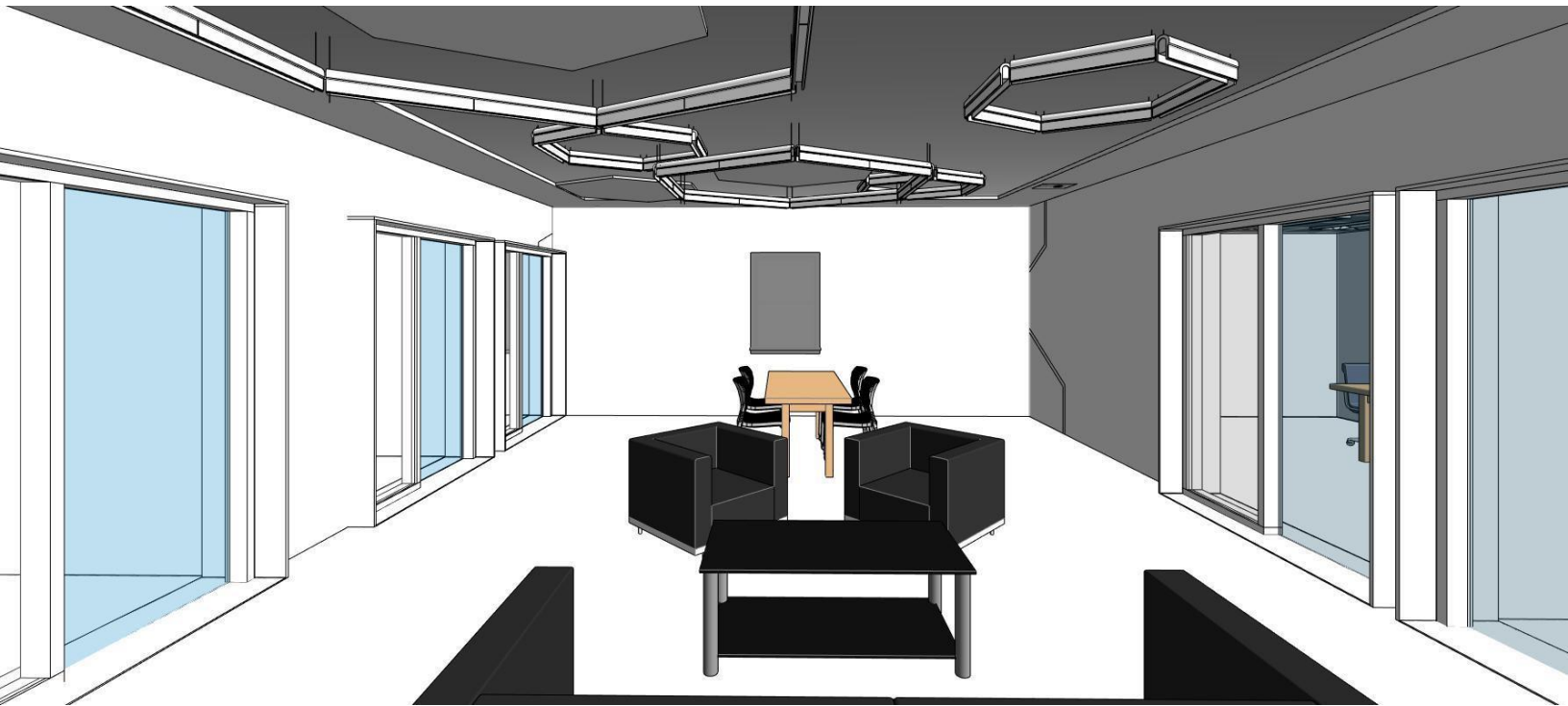


PROJECT MANUAL

FOR THE CONSTRUCTION OF THE

City Hall Annex Building Interior Renovation

5488 US HIGHWAY 441 S
NICHOLSON, GA. 30565



RELEASED FOR CONSTRUCTION

OWNER
CITY OF NICHOLSON
5488 US HIGHWAY 441 S, NICHOLSON GA 30565
PO BOX 365

ARCHITECT
STOCKDALE DESIGN
GROUP

POINT OF CONTACT
IRMA E. ROBLES
CITY CLERK
O 706 757 3408
M 706 248 0155
E CITYCLERK@NICHOLSON-GA.COM

The drawings, specifications, and other bidding documents of City of Nicholson for the Construction of the **City Hall Annex Building Interior Renovation** are provided for your use in offering bids in response to the Owner's invitation to bidders. Supplying these documents for bidding purposes does not convey any type of license for copying or transfer of ownership or intellectual property right, including copyright, to plan holders. No electronic devices, including photocopy, may be used to copy any part of these documents without the written permission of the Architect or other copyright holder.

All reports, plans, specifications, computer files, field data, notes and other documents and instruments prepared by City of Nicholson shall remain the property of City of Nicholson. The City of Nicholson shall retain all common law, statutory and other reserved rights including copyright thereto.

This project manual, the associated drawings and intellectual property are not to be reproduced or copied in whole or in part. They are only to be used for this project and sites specifically identified herein and are not to be used on any other projects unless approved in writing by the City of Nicholson.

ADVERTISEMENT FOR BIDS

PROJECT INFORMATION

- A. Notice to Bidders: Qualified bidders may submit bids for project as described in this Document. Submit bids according to the Instructions to Bidders.
 - 1. Regulatory Requirements: State of GA requirements and the **City of Nicholson** shall govern submittal, opening, and award of bids.
- B. Project Identification: **City of Nicholson Annex to the City Hall INTERIOR RENOVATION**
 - 1. Project Location: **5488 US Highway 441 S, Nicholson, GA 30565**
- C. Owner: **City of Nicholson**
 - 1. Owner's Representative: **Irma E. Robles, City Clerk**
- D. Architect:
 - 1. Stockdale Design Group
 - a. Darin F. Stockdale (Project Manager and Architect of Record)
 - 1) Mobile: 770-712-3472
 - 2) E-mail: Darin F. Stockdale
- E. Project Description: **The project consists of a 1,700 SF interior renovation on First Floor of Building with Business occupancy classification.**
 - 1. Project cost range is anticipated to be near **One Hundred Thousand U.S. Dollars (\$100,000).**
- F. Construction Contract: Bids will be received for the following Work:
 - 1. General Contract (all trades).

1.2 BID SUBMITTAL AND OPENING

- A. Owner will receive sealed lump sum bids until the bid time and date at the location given below. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:
1. Bid Date: **Wednesday March 12, 2025.**
 2. Bid Time: **10:00 a.m. local time.**
 3. Location:
 - a. Bids will be received by
**City of Nicholson
5488 US Highway 441 S,
Nicholson, GA 30565**
 4. Bidders shall be solely responsible for ensuring bids reach designated location by dates and times provided above.
- B. Bids will be thereafter publicly opened and read aloud.

1.3 PREBID MEETING

- A. Prebid Meeting: A Prebid meeting for all bidders will be held. Prospective prime bidders are encouraged to attend but the meeting is Non-Mandatory.
1. Prebid Date: **Wednesday February 19, 2025.**
 2. Prebid Time: **9:00 a.m. local time.**
 3. Prebid Location:
**City Hall Annex Building
5488 US Highway 441 S,
Nicholson, GA 30565**

1.4 QUESTIONS AND ADDENDA

- A. Deadline for Questions: **Tuesday March 11, 2025, 5:00 p.m. local time.**
1. Note: Questions during bidding should be directed to Chad A. Smith via email. All questions must be in writing.
- B. Final Addendum Issued: **Wednesday March 12, 2025, 10:00 a.m. local time.**
1. Note: All Addenda will be posted on the City's website. It is the sole responsibility of Bidder to ensure they have all Addenda.

1.5 DOCUMENTS

- A. Online Procurement and Contracting Documents: Obtain access after **Wednesday, February 12, 2025.** Online access will be provided to only registered bidders and suppliers. Electronic copies of the Procurement and Contracting Documents may be accessed and downloaded through the City's website. **E-mail cityclerk@nicholson-ga.com (Irma Robles) for an invitation.** Within the requestor's E-mail include the name of the requesting company as well as the name, e-mail, address and phone number of the individual requesting access. If an invitation has not been received via e-mail within 24 hours of the request from the City, call Mrs. Robles at 706-757-3408.

1.6 TIME OF COMPLETION

A. Successful bidder shall begin the Work on receipt of the Execution of the Contract and shall complete the Work within the Contract Time.

B. The Contractor agrees to substantially complete the entire Project within **Thirty (30)** consecutive calendar days from the date of the Execution of the Contract, and, the Contractor agrees to complete the final punch list and finally complete the Project within **Sixty (60)** consecutive calendar days from the date of the Execution of the Contract. The Contractor shall execute the work with due diligence to completion.

1.7 BIDDER'S QUALIFICATIONS

A. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work. A Performance Bond, separate Labor and Material Payment Bond, and Insurance in a form acceptable to Owner will be required of the successful Bidder.

1.8 NOTIFICATION

A. This Advertisement for Bids document is issued by **the City of Nicholson.**

END OF DOCUMENT

BIDDING PROCEDURE

Preparation of Bids:

Printable electronic Bid Forms and related documents are available from Architect – City of Nicholson. upon written request.

The Bid shall include unit prices when called for by the Procurement and Contracting Documents. Owner may elect to consider unit prices in the determination of award. Unit prices will be incorporated into the Contract.

Owner may elect to disqualify a Bid due to failure to submit a Bid in the form requested, failure to Bid requested alternates or unit prices, failure to complete entries in all blanks in the Bid Form, or inclusion by the Bidder of any alternates, conditions, limitations or provisions not called for.

Submission of bids:

Include Bidder's Contractor License Number applicable in Project jurisdiction on the face of the sealed bid envelope.
Each Bid must include a notarized affidavit providing your E-Verify registration number and a W-9. In addition to providing the required signed and notarized contractor affidavit before any Bid is considered, should the contractor use subcontractors, the contractor will secure from the subcontractor(s) attestation of each subcontractor's compliance with O.C.G.A. § 13-10-90 *et seq.* The contractor agrees to provide the City of Nicholson with all affidavits from any subcontractor engaged to perform services under any contract between the Contractor and Owner within 5 business days of the subcontractor being hired.

Modification or Withdrawal of Bids:

Such modifications to or withdrawal of a Bid may only be made by persons authorized to act on behalf of the Bidder. Authorized persons are those so identified in the Bidder's corporate bylaws, specifically empowered by the Bidder's charter or similar legally binding document acceptable to Owner, or by a power of attorney, signed and dated, describing the scope and limitations of the power of attorney. Make such documentation available to Owner at the time of seeking modifications or withdrawal of the Bid.

Owner will consider modifications to a Bid hand written on the outside of the sealed Bid envelope by authorized persons when such modifications comply with the following: the modification is indicated by a percent or stated amount to be added to or deducted from the Bid; written in ink; the amount of the Bid itself is not made known by the modification; a signature of the authorized person, along with the time and date of the modification, accompanies the modification. Completion of an unsealed

bid form, awaiting final figures from the Bidder, does not require power of attorney due to the evidenced authorization of the Bidder implied by the circumstance of the completion and delivery of the Bid.

If the Bid is forwarded by mail, the sealed envelope containing the Bid must be enclosed in another envelope to the attention of

CITY HALL ANNEX BUILDING INTERIOR RENOVATION

**Irma Robles, City Clerk, City of Nicholson 5488 US Highway
441 S, Nicholson, GA 30565**

All blank spaces for the lump sum price and alternate prices (if any) must be filled in completely, in ink or typewritten, in both words and figures. In case of discrepancies, the amount shown in words will govern. Prior to the Bid opening time, errors may be stricken or revisions may be made and corrections entered on the Bid Form, provided that any such strike-over or revision is signed in ink by the person signing the Bid of his/her Agent.

Break-Out Pricing Bid Supplement:

Provide detailed cost breakdowns no later than two business days following City's request.

CONSIDERATION OF BIDS

Rejection of Bids:

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

The City reserves the right to reject any and all bids for any reason or no reason at all and may elect not to proceed with the Project.

POSTBID INFORMATION

Contractor's Qualification Statement:

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

PERFORMANCE BOND AND PAYMENT BOND

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

Bidder agrees to finally complete the Project and Contract awarded within the "allowable calendar days for completion" from the date of the Execution of the Contract and he/she further agrees that the Owner may retain from the monies which may become due the amount of Two Hundred Fifty U.S. Dollars (\$250.00) per day for each and every day that the completion of the Project may be delayed.

Time of Delivery and Form of Bonds:

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

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

All sureties must either be authorized by the Insurance Commissioner of Georgia to do business in Georgia or must be on the United States Treasury's list of approved bond sureties. Proof of authorization by the Insurance Commissioner of Georgia to do business in Georgia or proof of its being on the United States Treasury's list of approved bond sureties must be included with each bond.

EXECUTION OF THE CONTRACT

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

END OF DOCUMENT

PREBID MEETINGS

PREBID MEETING

City of Nicholson will conduct a Prebid meeting.

Attendance:

1. Prime bidders: Attendance at Prebid meeting is **encouraged but is Non-Mandatory**.
2. Subcontractors: Attendance at Prebid meeting is **encouraged but is Non-Mandatory**.

Bidder Questions: Submit written questions to be addressed at Prebid meeting to the City by **seventy-two (72) hours prior** to the Prebid meeting date and time.

Agenda: Prebid meeting agenda will include review of topics that may affect proper preparation and submittal of bids, including the following:

1. Procurement and Contracting Requirements:

- a. Advertisement for bids.
- b. Instructions to bidders.
- c. Bidder Qualifications.
- d. Bonding.
- e. Insurance.
- f. Bid Security.
- g. Bid Form and Attachments.
- h. Bid Submittal Requirements.
- i. Bid Submittal Checklist.
- j. Notice of Award.

2. Communication during bidding Period:

- k. Obtaining documents.
- l. Access to Website.
- m. Bidder's Requests for Information.
- n. Bidder's Substitution Request/Prior Approval Request.
- o. Addenda.

3. Contracting Requirements:

- p. Agreement.
- q. The General Conditions.
- r. The Supplementary Conditions.
- s. Other Owner requirements.

4. Construction Documents:

- t. Scopes of Work.
- u. Temporary Facilities.
- v. Use of Site.
- w. Work Restrictions.
- x. Alternates, Allowances, and Unit Prices.
- y. Substitutions following award.

5. Separate Contracts:

- a. Work by Owner.
- b. Work of Other Contracts.

6. Schedule:

- a. Project Schedule.
- b. Contract Time.
- c. Liquidated Damages.
- d. Other Bidder Questions.

7. Site/facility visit or walkthrough.

8. Post-Meeting Addendum.

Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes to attendees. Minutes of meeting are issued as Available Information and do not constitute a modification to the Procurement and Contracting Documents. Modifications to the Procurement and Contracting Documents are issued by written Addendum only.

-Sign-in Sheet: Minutes will include list of meeting attendees.

-List of Plan holders: Minutes will include list of plan holders.

END OF DOCUMENT

PROCUREMENT SUBSTITUTION PROCEDURES

1.2 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.

1.3 PROCUREMENT SUBSTITUTIONS

- A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.
- B. Procurement Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action:
 - 1. Extensive revisions to the Contract Documents are not required.
 - 2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
 - 3. The request is fully documented and properly submitted.

1.4 SUBMITTALS

- A. Procurement Substitution Request: Submit to Architect. Procurement Substitution Request must be made in writing by prime contract Bidder only in compliance with the following requirements:
 - 1. Requests for substitution of materials and equipment will be considered if received no later than the **Questions Deadline** indicated in **Advertisement for Bids after which substitution requests will NOT be considered.**

2. Submittal Format: Submit one copy of each written Procurement Substitution Request via email, using form bound in the Project Manual (CSI Substitution Request Form 1.5C).
 - a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and drawing numbers.
 - b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
 - 1) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
 - 2) Copies of current, independent third-party test data of salient product or system characteristics.
 - 3) Samples where applicable or when requested by Architect.
 - 4) Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. 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.
 - 5) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - 6) Research reports, where applicable, evidencing compliance with building code in effect for Project, from applicable code organization.
 - 7) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.
 - c. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.
 - d. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Procurement Substitution Request.

B. Architect's Action:

1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Architect will notify all bidders of acceptance of the proposed substitute by means of an Addendum to the Procurement and Contracting Documents.

- C. Architect's approval of a substitute during bidding does not relieve Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents.

END OF DOCUMENT



SUBSTITUTION REQUEST (During the Bidding Phase)

Project: _____ Substitution Request Number: _____

 From: _____
 To: Stockdale Design Associates, LLC Date: _____
E-mail: stockdaledesign@hotmail.com A/E Project Number: _____
 Re: _____ Contract For: _____

Specification Title: _____ Description: _____
 Section: _____ Page: _____ Article /Paragraph: _____

Proposed Substitution: _____
 Manufacturer: _____ Address: _____ Phone: _____
 Trade Name: _____ Model No.: _____
 Installer: _____ Address: _____ Phone: _____
 History: New product 2-5 years old 5-10 years old More than 10 years old
 Differences between proposed substitution and specified product: _____

Point-by-point comparative data attached - REQUIRED BY Architect

Reason for not providing specified item: _____

Similar Installation:
 Project: _____ Architect: _____
 Address: _____ Owner: _____
 _____ Date Installed: _____

Proposed substitution affects other parts of Work: No Yes; explain _____

Savings to Owner for accepting substitution: _____ (\$ _____).

Proposed substitution changes Contract Time: No Yes [Add] [Deduct] _____ days.

Supporting Data Attached: Drawings Product Data Samples Tests Reports _____

**SUBSTITUTION
REQUEST
(Continued)**

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

Attachments: _____

A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01330.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by:

Date:

Additional Comments: Contractor Subcontractor Supplier Manufacturer A/E _____

PRELIMINARY CONSTRUCTION SCHEDULE

GENERAL

DESCRIPTION

A. Work Included:

- 1.** The Construction Schedule for the Project is provided in this section. This schedule includes specific dates shown.

1.2 GENERAL

- A. See the Owner Contractor Agreement and General Conditions.
- B. If all dates for Items **1** through **6** are maintained, then the dates for Items **6-13** become a fixed construction schedule.
- C. Should the schedule for Items **5** through **6** be delayed, then all subsequent dates for Items **7** through **13** shall move forward by the same number of days Item **6** misses its schedule, except as conditions may be altered by the General and Supplementary Conditions.

1.3 SCHEDULE

- A. The schedule dated for the project shall be strictly adhered to and are the last acceptable dates unless they are modified by mutual consent of the Owner and Contractor by written change order. All Dates indicate midnight unless otherwise stipulated.

B. PRELIMINARY SCHEDULE

1.	Advertisement for Bids	February, 2025
a.	Section 001113 – Advertisement for Bids	
2.	Non-mandatory Pre-Bid Meeting	February 19, 2025 9am
a.	Section 001113 – Advertisement for Bids	
3.	Last day for Bidder’s Questions and Substitution Requests	March 11, 2025 5pm
a.	Section 001113 – Advertisement for Bids	
4.	Last Addendum Date	March 12 ,2025 5pm
a.	Section 001113 – Advertisement for Bids	
5.	Sealed Bids Due (Bid Opening to follow)	March 12, 2025 1pm
a.	Section 001113 – Advertisement for Bids	
6.	Notice of Award	TBD
7.	Contract Agreement Date / Start of Contract Time	TBD
a.	Section 011000 - Summary	
8.	Receipt of Contractor’s Construction Schedule	14 days from 6
a.	Section 013200 – Construction Progress Documentation	
9.	Receipt of Contractor’s Schedule of Values	14 days from 6
10.	Receipt of Bonds and Insurance	14 days from 6
11.	Pre-construction Conferences	TBD
a.	Section 011000 - Summary	
12.	Substantial Completion	30 days from 6
a.	Section 001113 – Advertisement for Bids	
13.	Final Completion	60 days from 6
a.	Section 001113 – Advertisement for Bids	
14.	Delivery of Final Documents	90 days from 6

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

PERMIT APPLICATION

PERMIT APPLICATION INFORMATION

Permit Application: The building permit for Project **will be** applied for by the **City of Nicholson following the bid.**

END OF DOCUMENT

BID FORM - STIPULATED SUM (SINGLE-PRIME CONTRACT)

1.1 BID INFORMATION

- A. Bidder: _____.
- B. Project Name: **CITY HALL ANNEX BUILDING INTERIOR RENOVATION**
- C. Project Location: **5488 US Highway 441 S, Nicholson, GA 30565**
- D. Owner: **City of Nicholson**
- E. Architect (Architect of Record): Stockdale Design Associates LLC
 - 1. Architect Representative: Darin Stockdale

1.2 CERTIFICATIONS AND BASE BID

- A. Base Bid, Single-Prime (All Trades) Contract: The undersigned Bidder, having carefully examined the Procurement and Contracting Requirements, Conditions of the Contract, Drawings, Specifications, and all subsequent Addenda, as prepared for the City of Nicholson, having visited the site, and being familiar with all conditions and requirements of the Work, hereby agrees to furnish all material, labor, equipment and services, including all scheduled allowances, necessary to complete the construction of the above-named project, according to the requirements of the Procurement and Contracting Documents, for the stipulated sum of:
 - 1. _____ Dollars (\$_____).
 - 2. The above amount may be modified by amounts indicated by the Bidder on the attached Document "Unit Prices Form" and Document "Alternates Form."

1.3 BID GUARANTEE

- A. The undersigned Bidder agrees to execute a contract for this Work in the above amount and to furnish surety as specified within 10 days after a written Notice of Award, if offered within 60 days after receipt of bids, and on failure to do so agrees to forfeit to Owner the attached cash, cashier's check, certified check, U.S. money order, or bid bond, as liquidated damages for such failure, in the following amount constituting ten percent (10%) of the Base Bid amount above:
 - 1. _____ Dollars (\$_____).
- B. In the event Owner does not offer Notice of Award within the time limits stated above, Owner will return to the undersigned the cash, cashier's check, certified check, U.S. money order, or bid bond.

SUBCONTRACTORS AND SUPPLIERS

The following companies shall execute subcontracts for the portions of the Work indicated:

- 1. **Concrete Work:** _____.
- 2. **Framing Work:** _____.
- 3. **Masonry Work:** _____.
- 4. **Roofing Work:** _____.
- 5. **Plumbing Work:** _____.
- 6. **Mechanical Work:** _____.
- 7. **Electrical Work:** _____.

TIME OF COMPLETION

The undersigned Bidder proposes and agrees hereby to commence the Work of the Contract Documents on a date specified in a written Execution of the Contract to be issued by the City, and shall fully complete the Work within the time frame listed in **the document** included as part of this Bid Form.

ACKNOWLEDGEMENT OF ADDENDA

The undersigned Bidder acknowledges receipt of and use of the following Addenda in the preparation of this Bid:

- 1. Addendum No. 1, dated _____.
- 2. Addendum No. 2, dated _____.
- 3. Addendum No. 3, dated _____.
- 4. Addendum No. 4, dated _____.

CONTRACTOR'S LICENSE

The undersigned further states that it is a duly licensed contractor, for the type of work proposed, in **The State of Georgia** and overseeing **applicable jurisdiction(s) governing the location in which the project resides**, and that all fees, permits, etc., pursuant to submitting this proposal have been paid in full.

SUBMISSION OF BID

- A. Respectfully submitted this ____ day of _____, **2025**.
- B. Submitted By _____ (Name of bidding firm or corporation).
- C. Authorized Signature: _____ (Handwritten signature).
- D. Signed By: _____ (Type or print name).
- E. Title: _____ (Owner/Partner/President/Vice President).
- F. Witness By: _____ (Handwritten signature).
- G. Attest: _____ (Handwritten signature).
- H. By: _____ (Type or print name).
- I. Title: _____ (Corporate Secretary or Assistant Secretary).
- J. Street Address: _____.
- K. City, State, Zip _____.
- L. Phone: _____.
- M. License No.: _____.
- N. Federal ID No.: _____ (Affix Corporate Seal Here).

END OF DOCUMENT

SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Work restrictions.
5. Specification and drawing conventions.

1.2 PROJECT INFORMATION

A. Project Identification: **CITY HALL ANNEX BUILDING INTERIOR RENOVATION**

1. Project Location: **5488 US Highway 441 S, Nicholson, GA 30565**

B. Owner: **City of Nicholson**

1. Owner's Representative: **Irma E. Robles, City Clerk.**
2. Architect (Architect of Record): Stockdale Design Associates, LLC
3. Architect Representative: Darin Stockdale

Contractor: TBD

1.3 WORK COVERED BY CONTRACT DOCUMENTS

The Work of Project: **The project consists of a 1,770 SF interior renovation on First Floor of Building with Business occupancy classification.**

Type of Contract: Single Prime Lump Sum.

1.4 WORK UNDER SEPARATE CONTRACTS

General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or

other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

1.4 ACCESS TO SITE

- A. General: Contractors shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

1.5 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving adjacent facilities occupied by others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than two days in advance of proposed utility interruptions.
- C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other inordinate disruption to adjacent properties
- D. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted. Contractor may assign designated smoking areas for employee use. Designated smoking areas must be maintained by the contractor.

END OF SECTION

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

- A. The City will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.3 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. Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 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.
 - a. 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.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. 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.
 - e. Quotation Form: Use forms acceptable to the Architect and Owner as outlined in the agreement between Owner and Contractor.
- 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.

1.4 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: Refer to Contract Conditions (Agreement between Owner and Contractor) for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances, and accepted alternates.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Architect or Owner will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction or Work Change Directive: Architect and Owner may issue a Work Change Directive which instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Work 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 Work Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

END OF SECTION

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 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.

1.2 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.

1.3 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. 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 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
- b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

1.4 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.

1.5 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. 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.
 - 2. 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.
 - 3. 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.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. Refer to other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
- B. Product Selection Procedures:
 - 1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

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

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

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 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. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "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. 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.

3.4 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.
- 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.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- E. 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.

- F. 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.
- G. 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.
 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 in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 4. Ceilings: Patch, repair, or re-hang 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.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- 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.
 - 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.
- 3.7 STARTING AND ADJUSTING
- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
 - B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
 - C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.8 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

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Disposing of nonhazardous construction waste.

1.2 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. 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.
- C. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Recycle construction waste as per best practices standards and requirements of local authorities or as directed by Owner.

1.4 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Provide for waste disposal in accordance with state and local rules and regulation as well as any owner specified requirements. Provide training of work forces to implement plan.

PART 2 - EXECUTION

2.1 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.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

C. 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.

2.2 RECYCLING CONSTRUCTION WASTE, GENERAL

A. 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.

2.3 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. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.

1.2 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.

1.3 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

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. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 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.
- C. 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.

1.6 FINAL COMPLETION PROCEDURES

- A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
 1. Submit a final Application for Payment
 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 Owner. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit pest-control final inspection report and warranty.
 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner 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 that are outside the limits of construction.
 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file. Owner will return annotated copy.
 - b. PDF electronic file. Owner will return annotated copy.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - p. Leave Project clean and ready for occupancy.

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

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
1. Operation and maintenance documentation directory.
 2. Emergency manuals.
 3. Operation manuals for systems, subsystems, and equipment.
 4. Product maintenance manuals.
 5. Systems and equipment maintenance manuals.

1.2 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. Architect will comment on whether content of operations and maintenance submittals are acceptable.
 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
 2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.
- C. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training.

PART 2 -PRODUCTS

2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.
- B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- C. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- D. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2.2 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.

6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

2.3 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 is delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- 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.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 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.
- 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.

2.5 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.
- 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.
- 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. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- D. 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.
- E. 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.
- F. Comply with "Closeout Procedures" section for schedule for submitting operation and maintenance documentation.

END OF SECTION

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 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.
- B. Related Requirements:
 - 1. "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints and one paper copy set(s) of file prints.
 - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit PDF electronic files of scanned record prints and three set(s) of prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy and annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy and annotated PDF electronic files and directories of each submittal.

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. Record data as soon as possible after obtaining it.
 - c. Record and check the markup before enclosing concealed installations.
 2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 4. 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: Annotated PDF electronic file with comment function enabled.
 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.
- 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. Format: Annotated PDF electronic file with comment function enabled.
 3. 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.
 4. 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. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as scanned PDF electronic file(s) of marked-up paper copy of Specifications.

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 scanned PDF electronic file(s) of marked-up paper copy of Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as scanned PDF electronic file(s) of marked-up miscellaneous record submittals.

END OF SECTION

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 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.
 - 3. Demonstration and training video recordings.

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

1.3 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 content of training modules 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 individual training modules for each system and for equipment not part of a system(as indicated) including:
 - 1. Basis of System Design, Operational Requirements, and Criteria.
 - 2. Documentation.
 - 3. Emergencies.
 - 4. Operations.
 - 5. Adjustments and Troubleshooting.
 - 6. Maintenance and Repairs.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in "Operation and Maintenance Data" section.

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.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
- 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.

END OF SECTION

MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Wood blocking and nailers.
 2. Wood furring and grounds.
 3. Utility shelving.
 4. Plywood backing panels.

1.2 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.

1.3 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
1. Preservative-treated wood.
 2. Fire-retardant-treated wood.
 3. Power-driven fasteners.
- B. **Contractor shall provide certifications from treatment plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards. Provide a warranty from chemical treatment manufacturer.**
- C. **Contractor shall provide certifications from treatment plant stating that materials comply with specified standards and data relative to bearing strength, stiffness, and fastener-holding capacities of treated materials. Provide a warranty from chemical treatment manufacturer.**

1.6 QUALITY ASSURANCE

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

1.7 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, MANUFACTURERS

- A. **Treated materials: Manufacturers, subject to compliance with requirements, provide products by one of the following:**

- 1. **Wood-Preservative-Treated Materials:**
 - a. **Baxter: J. H. Baxter Co.**
 - b. **Chemical Specialties, Inc.**
 - c. **Continental Wood Preservers, Inc.**
 - d. **Hickson Corp.**
 - e. **Hoover Treated Wood Products, Inc.**
 - f. **Osmo Wood Preserving, Inc.**
- 2. **Fire-Retardant-Treated Materials, Interior Type A:**
 - a. **Baxter: J. H. Baxter Co.**
 - b. **Chemical Specialties, Inc.**
 - c. **Continental Wood Preservers, Inc.** d. **Hickson Corp.**
 - e. **Hoover Treated Wood Products, Inc.** f. **Dricon: Arch Wood Protection, Inc.**
- 3. **Fire-Retardant-Treated Materials, Exterior Type:**
 - a. **American Wood Treaters, Inc.**
 - b. **Hoover Treated Wood Products, Inc.**
 - c. **Dricon: Arch Wood Products, Inc.**

2.2 WOOD PRODUCTS, GENERAL

- A. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.3 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber indicated to receive stained or natural finish, mark grade stamp on end or back of each piece.
 - 3. Provide dressed lumber, S4S, unless otherwise indicated.
 - 4. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
- B. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable Design Stresses: Meet or exceed those indicated per manufacturer's published values determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Wood Structural Panels:

1. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.
2. Oriented Strand Board: DOC PS 2.
3. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."

D. **All rough carpentry shall be installed so that joints and connections are tight, true and well nailed; with members assembled and fastened in accordance with pertinent codes and regulations.**

2.4 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches above the ground in crawl spaces or unexcavated areas.

2.5 FIRE-RETARDANT-TREATED MATERIALS

A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20

minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664, and design value adjustment factors shall be calculated according to ASTM D 6841. For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- C. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
- D. **All fire-retardant-treated wood products are to be obtained from a single source and a single producer.**
- E. Application: Treat items indicated on Drawings, and the following:
1. Framing for raised platforms.
 2. Concealed blocking.
 3. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
 4. Plywood backing panels.
 5. **Where sills, nailers, and/or furring are in contact with concrete or masonry.**

2.6 DIMENSION LUMBER

- A. General: Of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade and any of the following species:
1. Mixed southern pine; SPIB.
 2. Eastern softwoods; NELMA.
 3. Northern species; NLGA.
 4. Western woods; WCLIB or WWPA.
- C. Framing Other Than Non-Load-Bearing Partitions: As noted on structural drawings.
1. Species and Grade: #2 SPF or better

D. Exposed Framing: Hand select material for uniformity of appearance and freedom from characteristics that would impair finish appearance.

1. Species and Grade: #2 SPF or better

2.7 TIMBER AND MISCELLANEOUS LUMBER

A. For timbers of 5-inch nominal size and thicker, provide material complying with the following requirements: As noted on structural drawings

B. Provide miscellaneous lumber for support or attachment of other construction, including the following:

1. Rooftop equipment bases and support curbs.
2. Blocking.
 - a. **Provide solid wood blocking and/or shims for finish materials to meet a tolerance of 1/4" maximum deviation in 10 feet when measured with at 10' straight edge. Such framing shall also be plumb and true. Blocking for wall mounted accessories to have live loads applied to them. Contractor is to provide all necessary hardware for mounting to blocking and such hardware should be non-corrosive.**
3. Cants.
4. Nailers.
5. Furring.
6. Grounds.

C. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 19 percent maximum moisture content of any species.

D. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.
2. Eastern softwoods, No. 2 Common grade; NELMA.
3. Northern species, No. 2 Common grade; NLGA.
4. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

2.8 ENGINEERED WOOD PRODUCTS

A. Laminated-Veneer Lumber: Composite of wood veneers with grain primarily parallel to member lengths, manufactured with exterior-type adhesive complying with ASTM D 2559. Allowable design values determined according to ASTM D 5456.

1. Available Manufacturers:
 - a. Boise Cascade Corporation.
 - b. Georgia-Pacific Corporation.
 - c. Louisiana-Pacific Corporation.
 - d. Pacific Woodtech Corp.
 - e. Trus Joist MacMillan.

- f. Union Camp Corp.; Building Products Division.
 - g. Willamette Industries, Inc.
2. Extreme Fiber Stress in Bending, Edgewise: 2850 psi for 12-inch nominal- depth members.
 3. Modulus of Elasticity, Edgewise: 2,000,000 psi.

2.9 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 1. Blocking.
 - a. **Provide solid wood blocking and/or shims for finish materials to meet a tolerance of 1/4" maximum deviation in 10 feet when measured with at 10' straight edge. Such framing shall also be plumb and true. Blocking for wall mounted accessories to have live loads applied to them. Contractor is to provide all necessary hardware for mounting to blocking and such hardware should be non-corrosive.**
 2. Nailers.
 3. Furring.
 4. Utility shelving.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.
- C. For utility shelving, provide lumber with 15 percent maximum moisture content of eastern white pine, Idaho white, lodgepole, ponderosa, or sugar pine; Premium or No. 2 Common (Sterling) grade; NeLMA, NLGA, WCLIB, or WWPA.
- D. For concealed boards, provide lumber with 15 19 percent maximum moisture content and any of the following species and grades:
 1. Mixed southern pine, No. 2 grade; SPIB.
 2. Eastern softwoods, No. 2 Common grade; NELMA.
 3. Northern species, No. 2 Common grade; NLGA.

2.10 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, **Exposure 1, C-D Plugged**, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.11 FASTENERS

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

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners **with a hot-dip zinc coating per ASTM A 153 or** of Type 304 stainless steel.
- B. **Nails, Wire, Brads, and Staples shall meet FS FF-N-105. Power-Driven Fasteners: CABO NER-272.**
- C. **Wood Screws shall meet ASME B18.6.1.**
- D. **Lag Bolts shall meet ASME B18.2.1.**
- E. **Steel bolts shall comply with ASTM A 307, Grade A, with ASTM A 563 hex nuts, and flat washers.**
- F. **Expansion Anchors: Require 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.**
- G. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.

2.12 MISCELLANEOUS MATERIALS

- A. Adhesives for Gluing Furring to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
- B. Flexible Flashing: Self-adhesive butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit.
- B. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

- D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
- E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- F. Securely attach carpentry work to substrate by anchoring and fastening complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

3.2 PROTECTION

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

END OF SECTION

SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Composite nail base insulated roof sheathing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

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

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated plywood.
2. Fire-retardant-treated plywood.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fireretardant-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.

1.6 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: As tested according to ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat all plywood unless otherwise indicated.

2.3 FIRE-RETARDANT-TREATED PLYWOOD

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201/D 3201M at 92 percent relative humidity. Use where exterior type is not indicated.
 - 3. Design Value Adjustment Factors: Treated lumber plywood shall be tested according to ASTM D 5516 and design value adjustment factors shall be

calculated according to ASTM D 6305. Span ratings after treatment shall be not less than span ratings specified.

- C. Kiln-dry material after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.
- E. Application: Treat plywood as indicated on Drawings.

2.4 WALL SHEATHING

- A. Fiberglass Mat Gypsum Sheathing: Exterior, Non combustible. **Basis of design: Georgia Pacific DensGlass Gold**
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Georgia Pacific
 - b. National Gypsum.
 - c. United States Gypsum Company.
 - d. Approved equal prior to bid.
 - 2. Thickness: As indicated.
- B. Plywood Sheathing: Exterior soffits and fascia as noted on construction drawings. Structural I sheathing. **Fire rated**

2.5 ROOF AND PARAPET SHEATHING

- A. Plywood Sheathing: Exterior, Structural I sheathing. **Fire rated**

2.6 COMPOSITE NAIL BASE INSULATED ROOF SHEATHING

- A. Oriented-Strand-Board-Surfaced, Polyisocyanurate-Foam Sheathing: ASTM C 1289, Type V with DOC PS 2, Exposure 1 oriented strand board on one face.
 - 1. Polyisocyanurate-Foam Thickness: **R-25 value required.**
 - 2. Oriented-Strand-Board Nominal Thickness: 5/8 inch."

2.7 FASTENERS

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

2.8 WOOD PANEL PRODUCTS

- B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- C. Factory mark panels to indicate compliance with applicable standard.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Wall and Roof Sheathing:
 - a. Nail to wood framing.
 - b. Screw to cold-formed metal framing.
 - c. Space panels 1/8 inch apart at edges and ends.

END OF SECTION

FINISH CARPENTRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Interior Trim
- B. Finish carpentry items

1.2 RELATED REQUIREMENTS

- A. Product Data: For each type of process and factory-fabricated product.
- B. Samples: For each type.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors 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. Include chemical treatment manufacturer's written instructions for finishing treated material.
 - 2. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
 - 3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.
- C. Samples for Initial Selection: For each type of product involving selection of colors, profiles, or textures.

1.4 INFORMATIONAL SUBMITTALS

- A. Compliance Certificates:
 - 1. For lumber that is not marked with grade stamp.
 - 2. For preservative-treated wood that is not marked with treatment-quality mark.
 - 3. For fire-retardant-treated wood that is not marked with classification marking of testing and inspecting agency.
- B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Cellular PVC trim.
4. Foam plastic moldings.

C. Sample Warranties: For manufacturer's warranties.

1.6 QUALITY ASSURANCE

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

B. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

C. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

1.7 DELIVERY, STORAGE, AND HANDLING

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

1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecast weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.

1. For exterior ornamental wood columns, comply with manufacturer's written instructions and warranty requirements.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20.

1. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.
 - a. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by inspection agency.
- B. Softwood Plywood: DOC PS 1.
- C. Hardboard: AHA A135.4.
- D. MDF: ANSI A208.2, Grade 130 .
- E. Particleboard: ANSI A208.1, Grade M-2.
- F. Melamine-Faced Particleboard: Particleboard complying with ANSI A208.1, Grade M-2, finished on both faces with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.
 1. Color: As selected by Architect from manufacturer's full range.

2.2 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent respectively.
- B. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
 1. For exposed lumber and plywood indicated to receive a stained or natural finish, mark back of each piece.
- C. Application: Where indicated.

2.3 INTERIOR TRIM

- A. Hardwood Lumber Trim (**painted wall base**):
 1. Species and Grade: **Aspen, basswood, cottonwood, sap gum, sycamore, white maple, or yellow poplar**; Clear; NHLA.
 2. Maximum Moisture Content: 13 percent.
- B. Hardwood Moldings for Transparent Finish (Clear Finish): WMMPA HWM 2, N-grade wood moldings made to patterns included in WMMPA HWM 1.

1. Species: **WD-1 as indicated on drawings.**
 2. Maximum Moisture Content: 9 percent.
- C. Moldings for Opaque Finish (Painted Finish): Made to patterns included in WMMPA WM 12.
1. Hardwood Moldings: WMMPA HWM 2, P-grade.
 - a. Species: **Aspen, basswood, cottonwood, gum, magnolia, soft maple, tupelo, or yellow poplar.**
 - b. Maximum Moisture Content: 9 percent.
- D. Molding Patterns:
1. Base Pattern: **As indicated on drawings.**
 2. Shoe-Mold Pattern: **Not used.**
 3. Chair-Rail Pattern: **Not used.**

2.4 PANELING

- A. Hardwood Veneer Plywood Paneling: Manufacturer's stock hardwood plywood panels complying with HPVA HP-1(**WD-1 as indicated on drawings**).
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Chesapeake Hardwood Products, Inc.
 2. Georgia-Pacific Building Products.
 3. Holland Southwest International.
- C. Board Paneling:
1. Species and Grade: **WD-1 as indicated on drawings**; NeLMA, NLGA, or WWPA.
 2. Maximum Moisture Content: 15 percent.

2.5 SHELVING

- A. Shelving: Made from following materials, 3/4 inch thick.
4. Hardwood Boards (**Exposed to View**): **White Oak 1x6 tongue and groove**; NLGA, WCLIB, or WWPA;; SPIB; kiln dried.
- B. Shelf Brackets with Rod Support: BHMA A156.16, B04051; prime-painted formed steel.

2.7 MISCELLANEOUS MATERIALS

- A. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

- B. Paneling Adhesive: Comply with paneling manufacturer's written recommendations for adhesives.

2.8 FINISH (FOR WD-1)

- A. Grade: **Custom.**
- B. Finish: **Two coats 2000 Flat Water based Polyurethane.**
- C. Staining: **Two coats natural sealer.**
- D. Effect: **Open-grain finish.**
- E. Sheen: **Satin.**

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.2 INSTALLATION, GENERAL

- A. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 2. Countersink fasteners, fill surface flush, and sand unless otherwise indicated.
 3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
 4. Install stairs with no more than 3/16-inch variation between adjacent treads and risers and with no more than 3/8-inch variation between largest and smallest treads and risers within each flight.

3.3 STANDING AND RUNNING TRIM INSTALLATION

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

3.4 PANELING INSTALLATION

- A. Plywood Paneling: Select and arrange panels on each wall to minimize noticeable variations in grain character and color between adjacent panels. Leave 1/4-inch gap

to be covered with trim at top, bottom, and openings. Install with uniform tight joints between panels.

1. Attach panels to supports with manufacturer's recommended panel adhesive and fasteners. Space fasteners and adhesive as recommended by panel manufacturer.
 2. Conceal fasteners to greatest practical extent.
- B. Hardboard Paneling: Install according to manufacturer's written recommendations. Leave 1/4-inch gap to be covered with trim at top, bottom, and openings. Butt adjacent panels with moderate contact. Use fasteners with prefinished heads matching paneling color.
- C. Board Paneling: Arrange in random-width pattern suggested by manufacturer unless boards or planks are of uniform width.
1. Install in full lengths without end joints.
 2. Stagger end joints in random pattern to uniformly distribute joints on each wall.
 3. Select and arrange boards on each wall to minimize noticeable variations in grain character and color between adjacent boards. Install with uniform tight joints between boards.
 4. Fasten paneling by face nailing, setting nails, and filling over nail heads.
 5. Fasten paneling with trim screws, set below face and filled.
 6. Fasten paneling by blind nailing through tongues.

3.5 SHELVING

- A. Cut shelf cleats at ends of shelves about 1/2 inch less than width of shelves and sand exposed ends smooth.
- B. Install shelf cleats by fastening to framing or backing with finish nails or trim screws, set below face and filled. Space fasteners not more than 16 inches o.c.
- C. Cut shelves to neatly fit openings with only enough gap to allow shelves to be removed and reinstalled. Install shelves, fully seated on cleats, brackets, and supports.

END OF SECTION

ARCHITECTURAL MILLWORK

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. Architectural cabinets.
2. Wood furring, blocking, shims, and hanging strips for installing architectural cabinets that are not concealed within other construction.
3. Shop finishing of architectural cabinets.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets that are concealed within other construction before cabinet installation.

1.3 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at **Project site**.

1.5 ACTION SUBMITTALS

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

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- C. Shop Drawings: For architectural cabinets.
1. Include plans, elevations, sections, and attachment details.
 2. Show **large-scale** details.
 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 items installed in architectural cabinets.
 5. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
 6. Apply **AWI Quality Certification** or **WI Certified Compliance** Program label to Shop Drawings.
- D. Samples: For each exposed product and for each color and finish specified, in manufacturer's standard size.
- E. Samples for Initial Selection: For each type of exposed finish.
- F. Samples for Verification: For the following:
1. Lumber for Transparent Finish: Not less than **5 inches (125 mm) wide by 12 inches (300 mm) long** for each species and cut, finished on one side and one edge.
 2. Veneer Leaves: Representative of and selected from flitches to be used for transparent-finished cabinets.
 3. Lumber and Panel Products with Shop-Applied Opaque Finish: **5 inches (125 mm) wide by 12 inches (300 mm) long** for lumber and **12 by 12 inches (300 by 300 mm)** for panels, for each finish system and color.
 - a. Finish **entire** exposed surface.
 4. Thermoset Decorative Panels: **12 by 12 inches (300 by 300 mm)**, for each color, pattern, and surface finish.
 - a. Provide edge banding on one edge.
 5. Corner Pieces:
 - a. Cabinet-front frame joints between stiles and rails and at exposed end pieces, 18 inches (450 mm) high by 18 inches (450 mm) wide by 6 inches (150 mm) deep.
 - b. Miter joints for standing trim.
 6. Exposed Cabinet Hardware and Accessories: One full-size unit for each type and finish.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For **manufacturer and Installer**.
- B. Product Certificates: For **the following**:
 - 1. Composite wood and agrifiber products.
 - 2. Thermoset decorative panels.
 - 3. Glass.
 - 4. Adhesives.
- C. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.
- D. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Quality Standard Compliance Certificates: **AWI Quality Certification Program** or **WI Certified Compliance Program** certificates.

1.8 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
 - 1. Manufacturer's Certification: Licensed participant in **AWI's Quality Certification Program** or **WI's Certified Compliance Program**].
- B. Hardware Manufacturer Qualifications: A manufacturer capable of fabricating hardware that meets or exceeds performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, and calculations.
 - 1. Manufacturer to have ISO 9001 quality management system registration.
- C. Installer Qualifications: **Licensed participant in AWI's Quality Certification Program** or **Licensed participant in WI's Certified Compliance Program**.
 - 1. **Any firm producing architectural woodwork must document 5 years of experience with a record of successful in-service performance, as well as sufficient production capacity to produce required units specified in the documents.**
 - 2. **The qualified woodworking firm shall assume undivided responsibility for fabricating, finishing, and installing woodwork specified.**
- D. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build mockups of **typical architectural cabinets as shown on Drawings. Specifically finger pull on cabinets.**
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.10 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 levels planned for building occupants during the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between **25 and 55** percent during the remainder of the construction period.
- 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.
 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.
- D. 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.

1.11 WARRANTY

- A. Hardware Manufacturer's Warranty: Manufacturer agrees to replace hardware components that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: Limited Lifetime from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINET MANUFACTURERS

- A. Source Limitations: Engage a qualified woodworking firm to assume responsibility for production of architectural cabinets with sequence-matched wood veneers **wood paneling, wood doors with face veneers that are sequence matched with architectural cabinets and transparent-finished wood doors that are required to be of same species as architectural cabinets.**

2.2 CABINETS, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of architectural cabinets indicated for construction, finishes, installation, and other requirements.
 - 1. Provide **labels and certificates** from **AWI** or **WI** certification program indicating that **woodwork and installation** complies with requirements of grades specified.
 - 2. The Contract Documents contain requirements that are more stringent than the referenced **woodwork quality standard**. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

2.3 WOOD CABINETS FOR TRANSPARENT FINISH

- A. Architectural Woodwork Standards Grade: **Custom.**
- F. Type of Construction: **Refer to Drawings.**
- G. Door and Drawer-Front Style: **Flush overlay.**
- H. Wood for Exposed Surfaces: **As indicated on Drawings.**
 - 1. Species: **WD-1 as indicated on drawings.**
 - 2. Blueprint Matching: Comply with veneer and other matching requirements indicated for blueprint-matched paneling.
 - 3. Cut: **Plain sliced.**
 - 4. Grain Direction: **Vertically for drawer fronts, doors, and fixed panels.**
 - 5. Matching of Veneer Leaves: **Random** match.
 - 6. Veneer Matching within Panel Face: **Running** match.
 - 7. Veneer Matching within Room: Provide cabinet veneers in each room or other space from a single flitch with doors, drawer fronts, and other surfaces matched in a sequenced set with continuous match where veneers are interrupted perpendicular to the grain.
- I. Semiexposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies: **Same species and cut indicated for exposed surfaces.**

2. Drawer Subfronts, Backs, and Sides: **Solid-hardwood lumber, stained to match species indicated for exposed surfaces**
 3. Drawer Bottoms: **Hardwood plywood.**
- J. Dust Panels: 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers unless located directly under tops.
- K. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
1. Join subfronts, backs, and sides with **glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.**

2.4 WOOD CABINETS FOR OPAQUE FINISH

- A. Architectural Woodwork Standards Grade: **Custom.**
- G. Type of Construction: **Frameless.**
- H. Door and Drawer-Front Style: **Flush overlay.**
- I. Species for Exposed Lumber Surfaces: Any closed-grain hardwood.
- J. Panel Product for Exposed Surfaces: **Hardwood plywood.**
- K. Semiexposed Surfaces:
1. Surfaces Other Than Drawer Bodies: **Match materials indicated for exposed surfaces.**
 - a. Edges of Thermoset Decorative Panel Shelves: PVC or polyester edge banding.
 2. Drawer Sides and Backs: **Solid-hardwood lumber.**
 3. Drawer Bottoms: **Hardwood plywood.**
- L. Dust Panels: 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers unless located directly under tops.
- M. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
1. Join subfronts, backs, and sides with **glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.**

2.5 WOOD MATERIALS

- A. **General:**
1. **All materials shall comply with requirements of the AWI quality standard for each type of woodwork and quality grade.**

2. Provide Medium-Density Fiberboard: ANSI A208.2 (latest edition), Grade MD-Exterior Glue. No exposed, unfinished MDF surfaces. All MDF surfaces must be painted or veneer.

3. Provide ¾ in. exterior grade plywood at sinks and wet locations

4. Provide High-Pressure Decorative Laminate: NEMA LD-3 (latest edition), grades as required by woodwork quality standard.

5. Solid-Surfacing Material shall be homogeneous solid sheets of filled plastic resin complying with ISSFA-2.

6. The interior of all Custom grade cabinetry shall be white melamine.

B. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
2. Wood Moisture Content: **4 to 9** percent.

C. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

E. Composite Wood Products: Formaldehyde emission rates shall not be greater than the following when tested in accordance with ASTM D6007 or ASTM E1333:

1. Hardwood Plywood: 0.05 ppm.
2. Particleboard: 0.09 ppm.
3. MDF More Than 5/16 Inch (8 mm) Thick: 0.11 ppm.
4. MDF 5/16 Inch (8 mm) or Less in Thickness: 0.13 ppm.

F. Composite Wood Products: Products shall be made without urea formaldehyde.

1. MDF: ANSI A208.2, **Grade 130**.
2. Particleboard: ANSI A208.1, [**Grade M-2**] [**Grade M-2-Exterior Glue**].
3. Particleboard: Straw-based particleboard complying with requirements in ANSI A208.1, Grade M-2, except for density.

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Environ Biocomposites Manufacturing LLC.
- 2) Sorm Incorporated.
- 3) Architect approved equal prior to Bid.

4. Softwood Plywood: DOC PS 1, **medium-density overlay**.
5. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

6. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.6 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
 1. Use treated materials that comply with requirements of referenced quality standard. Do not use materials that are warped, discolored, or otherwise defective.
 2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
 3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.
- B. Fire-Retardant-Treated Lumber and Plywood: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 1. Kiln-dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent, respectively.
 2. For items indicated to receive a stained or natural finish, use organic resin chemical formulation.
 3. Mill lumber after treatment within limits set for wood removal that do not affect listed fire-test-response characteristics, using a woodworking shop certified by testing and inspecting agency.
 4. Mill lumber before treatment and implement procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of architectural cabinets.
- C. Fire-Retardant Particleboard: Made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 25 or less per ASTM E84.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Flakeboard Company Limited.
 - b. SierraPine.
 - c. Architect approved equal prior to Bid.

2. For panels 3/4 inch (19 mm) thick and less, comply with ANSI A208.1 for Grade M-2 except for the following minimum properties: modulus of rupture, 1600 psi (11 MPa); modulus of elasticity, 300,000 psi (2070 MPa); internal bond, 80 psi (550 kPa); and screw-holding capacity on face and edge, 250 and 225 lbf (1100 and 1000 N), respectively.
 3. For panels 13/16 to 1-1/4 inches (20 to 32 mm) thick, comply with ANSI A208.1 for Grade M-1 except for the following minimum properties: modulus of rupture, 1300 psi (9 MPa); modulus of elasticity, 250,000 psi (1720 MPa); linear expansion, 0.50 percent; and screw-holding capacity on face and edge, 250 and 175 lbf (1100 and 780 N), respectively.
- D. Fire-Retardant Fiberboard: MDF panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 200 or less per ASTM E84.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Panel Source International, Inc.
 - b. SierraPine.
 - c. Architect approved equal prior to Bid.

2.7 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087111 "Door Hardware".
1. Basis-of-Design Product: Subject to compliance with requirements, provide Grass America Inc.; Cabinet hardware and accessories or comparable product by one of the following:
 - a. Accuride International.
 - b. Blum, Julius & Co., Inc.
 - c. CompX International, Inc.
 - d. Hettich America L.P.
 - e. Knappe & Vogt Manufacturing Company.
 - f. Architect approved equal prior to Bid.
- B. **Frameless** Concealed Hinges (European Type): ANSI/BHMA A156.9, Grade 2, B01602, **170** degrees of opening, **self-closing, soft-closing**.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Grass America Inc.; [**Tiomos**] [**Nexis**] frameless hinge system or comparable product.
 2. Overlays: [**Full**] [**Overlay**] [**Half**] [**Inset**].
 3. Cup Assembly: [**Screw-on**] [**Tool-free application**] [**Dowelled**].
 4. Material: **Nickel-plated steel**.
 5. Cup Diameter: 1.38 inch (35mm).
 6. Cup Depth: [**0.39 inch (10 mm)**] [**0.43 inch (10.8 mm)**] [**0.46 inch (11.8 mm)**] [**0.5 inch (12.6 mm)**] [**0.52 inch (13.2 mm)**].

- E. Closer Adapters: Non-handed; mounted independent of hinge; used for face-frame cabinet doors on all overlays and for full-overlay frameless cabinet doors.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Grass America Inc.; Unisoft Soft-Close System or comparable product.

- F. Side-Mounted Drawer Slides: ANSI/BHMA A156.9, Grade 1.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Grass America Inc.; **Ball-Bearing Slide** or comparable product.
 - 2. Grade 1: Side mounted **and extending under bottom edge of drawer**.
 - a. Type: **Full** extension.
 - b. Material: **Galvanized cold-rolled steel with steel ball-bearings**.
 - c. Load Capacity: **75 lb (34 kg)**.
 - 3. Grade 1: Side mounted; full-extension type; zinc-plated steel, ball-bearing slides.
 - 4. Drawers:
 - a. Grade 1: 3 inches (75 mm) high and 24 inches (600 mm) wide or less.
 - b. Grade 1: 3 to 6 inches (75 to 150 mm) high and 24 inches (600 mm) wide or less.
 - c. Grade 1: 6 inches (150 mm) or higher, or 24 inches (600 mm) wide or wider.
 - 5. Computer Keyboard Shelves: Grade 1.
 - 6. Trash Bins: Grade 1; 20 inches (500 mm) high and 16 inches (400 mm) wide or less.

- G. Undermount Drawer Slides: ANSI/BHMA A156.9, Grade 1.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Grass America Inc.; [**Dynapro**] [**Elite Plus**] [**Maxcess**] or comparable product.
 - 2. Grade 1: Side mounted **and extending under bottom edge of drawer**.
 - a. Type: **Full** extension.
 - b. Material: Galvanized cold-rolled steel.
 - c. Load Capacity: **75 lb (34 kg)**.
 - 3. Drawers:
 - a. Grade 1: 3 inches (75 mm) high and 24 inches (600 mm) wide or less.
 - b. Grade 1: 3 to 6 inches (75 to 150 mm) high and 24 inches (600 mm) wide or less.
 - c. Grade 1: 6 inches (150 mm) or higher, or 24 inches (600 mm) wide or wider.
 - 4. Computer Keyboard Shelves: Grade 1.
 - 5. Trash Bins: Grade 1; 20 inches (500 mm) high and 16 inches (400 mm) wide or less.

- H. Opening Systems: Mechanical opening system.
 - 3. Drawers:
 - a. Grade 1: 3 inches (75 mm) high and 24 inches (600 mm) wide or less.
 - b. Grade 1: 3 to 6 inches (75 to 150 mm) high and 24 inches (600 mm) wide or less.

- c. Grade 1: 6 inches (150 mm) or higher, or 24 inches (600 mm) wide or wider.
- 4. Computer Keyboard Shelves: Grade 1.
- 5. Trash Bins: Grade 1; 20 inches (500 mm) high and 16 inches (400 mm) wide or less.

I. Additional requirements (to supersede conflicting requirements)

- 1. **Provide manufacturers and BHMA numbers to designate hardware requirements.**
- 2. **Provide Butt Hinges that are semi-concealed hinges for overlay doors and comply with BHMA A156.9 Grade 1 criteria.**
- 3. **Catches if required shall be provided as push-in magnetic catches complying with BHMA A156.9 Grade 1 criteria.**
- 4. **Provide shelf rests that comply with BHMA A156.9 Grade 1 criteria.**
- 5. **Provide back mounted wire pulls, 5 inches long, 2-1/2 inches deep and 5/16" in diameter.**
- 6. **Provide shelf rests complying with BHMA A156.9, B04013.**
- 7. **Provide drawer slides that are side-mounted, full-extension, zinc-plated steel drawer slides with steel ball bearings that comply with BHMA A156.9, Grade 1 criteria and rated for the following loads:**
 - a. **Box Drawer Slides: 100 lbf**
 - b. **File Drawer Slides: 200 lbf**
 - c. **Keyboard Slide: 100 lbf**
- 8. **Provide locks as required that comply with ANSI 156.11, grade 1 cycle testing. Confirm if locks need to be keyed alike.**
- 9. **Provide molded-plastic grommets for cable passage through countertops. Coordinate proper size required for use. Specify number of grommets required with a minimum of one (1) at each workstation.**
- 10. **Exposed hardware Finish: Specify finish complying with BHMA A156.18 for BHMA finish:**
 - a. **Satin Stainless Steel: BHMA 630**

2.8 OTHER CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in **Section 087111 "Door Hardware."**

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Accuride International.
 - b. Blum, Julius & Co., Inc.
 - c. CompX International, Inc.

- d. Hettich America L.P.
- e. Knappe & Vogt Manufacturing Company.
- f. Architect approved prior to Bid.

- B. Catches: **Magnetic catches, ANSI/BHMA A156.9, B03141**
- C. Shelf Rests: ANSI/BHMA A156.9, B04013; **metal**.
- D. Slides for Sliding Glass Doors: ANSI/BHMA A156.9, B07063; **aluminum**.
- E. Door Locks: ANSI/BHMA A156.11, E07121.
- F. Drawer Locks: ANSI/BHMA A156.11, E07041.
- G. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.
- H. Grommets for Cable Passage: **2-inch (51-mm) OD**, molded-plastic grommets and matching plastic caps with slot for wire passage.
 - 1. Color: **White solid surface: white; dark colored solid surface or wood: black**
- I. Exposed Hardware Finishes: **All hardware to be concealed from view**.
- J. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.

2.9 DRAWER SYSTEMS

- A. Drawer Systems: ANSI/BHMA 156.9, Grade 1, full extension, double-walled, side-profile, steel drawer system with a synchronized, full-extension, soft-close drawer slide.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Grass America Inc.; Nova Pro Drawer System or comparable product by one of the following:
 - a. Accuride International.
 - b. Blum, Julius & Co., Inc.
 - c. CompX International, Inc.
 - d. Hettich America L.P.
 - e. Knappe & Vogt Manufacturing Company.
 - f. Architect approved prior to Bid.
 - 2. Drawer Side Height: **4.75 inches (122 mm)**.
 - 3. Load Capacity: **84 lb (38 kg)**.
 - 4. Cabinet Member Set, 84 lb (38 kg): [**11 inches (270 mm)**] [**14 inches (350 mm)**] [**16 inches (400 mm)**] [**18 inches (450 mm)**] [**20 inches (500 mm)**] [**22 inches (550 mm)**].
 - 5. Cabinet Member Set, 154 lb (70 kg): [**18 inches (450 mm)**] [**20 inches (500 mm)**] [**22 inches (550 mm)**].
 - 6. Mounting brackets: [**Screw-on**] [**Dowelled**].

2.10 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: **Softwood or hardwood lumber, Fire-retardant-treated softwood lumber**, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
 - 1. **Provide Screws to be select material, type, size, and finish required for each use. Comply with ASME B18.6.1 for applicable requirements.**
 - a. **For metal framing supports, specify screws as recommended by metal-framing manufacturer.**
 - 2. **Provide Nails to be select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.**
 - 3. **Provide Anchors to be select material, type, size, and finish required for each substrate for secure anchorage. Specify nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Specify toothed steel or lead expansion bolt devices for drilled-in-place anchors.**
- C. Adhesives: Use adhesives that meet 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."
- D. Adhesives: Do not use adhesives that contain urea formaldehyde.
- E. Adhesives: Do not use adhesives that contain urea formaldehyde.

2.11 FABRICATION

- A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- B. Fabricate architectural cabinets to dimensions, profiles, and details indicated. Ease edges and corners to 1/16-inch (1.5-mm) radius unless otherwise indicated.
- C. Assemble drawer systems in accordance with manufacturer's written instructions.
- D. 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.
 - 1. Notify Architect seven days in advance of the dates and times architectural cabinet fabrication will be complete.
 - 2. Trial fit assemblies at manufacturer's shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as

intended and check measurements of assemblies against field measurements before disassembling for shipment.

- E. 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.
- F. Install glass to comply with applicable requirements in Section 088000 "Glazing" and in GANA's "Glazing Manual."
 - 1. For glass in wood frames, secure glass with removable stops.
 - 2. For exposed glass edges, polish and grind smooth.

G. Additional Requirements

- 1. **Specify the following requirements for interior woodwork grade: interior woodwork shall comply with the referenced quality standard and of the following grade:**
 - a. **Grade:**
 - i. **Premium Grade in public areas, executive offices, and meeting rooms. This grade shall be specified in all areas of high use and other areas requiring premium finish materials and full edge laminations.**
 - ii. **Custom Grade in all other areas.**
- 2. **Specify the following requirements for wood moisture content: comply with requirements of referenced quality standard for wood moisture content in relation to relative humidity conditions existing during time of fabrication and in installation areas.**
- 3. **All woodwork shall have eased edges to radius indicated for the following:**
 - a. **Corners of cabinets and edges of solid-wood (lumber) members 3/4 inch thick or less: 1/16 inch.**
 - b. **Edges of rails and similar members more than 3/4 inch thick: 1/8 inch.**
- 4. **Specify complete fabrication, including assembly, and hardware application, before shipment to Project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.**
- 5. **Specify shop-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Specify to locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Require smooth edges of cutouts and, where located in countertops and similar exposures, seal edges with a water-resistant coating.**

2.12 SHOP FINISHING

- A. General: Finish architectural cabinets at manufacturer's shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of cabinets.
- B. Transparent Finish:
1. Architectural Woodwork Standards Grade: **Custom**
 2. Finish: System - **water-based polycrylic sealer**.
 3. Wash Coat for Closed-Grain Woods: Apply wash-coat sealer to cabinets made from closed-grain wood before staining and finishing.
 4. Staining: **None required**.
 5. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
 6. Sheen: **Satin, 31-45**.
- C. Opaque Finish:
1. Architectural Woodwork Standards Grade: **Custom**.
 2. Finish: System - **water-based polyurethane**.
 3. Color: **Refer to Drawings**.
 4. Sheen: **Satin, 31-45**.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

3.2 INSTALLATION

- A. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.
1. Install drawer systems in accordance with manufacturer's written instructions.
- C. 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 cabinet surface.
1. For shop-finished items, use filler matching finish of items being installed.
- D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) using concealed shims.
1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

2. Install cabinets without distortion so doors and drawers fit openings 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.
 3. Maintain veneer sequence matching of cabinets with transparent finish.
 4. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with **No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips** or **No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish** or **toggle bolts through metal backing or metal framing behind wall finish**].
- E. Shop Finishes: Touch up finishing after installation of architectural cabinets. Fill nail holes with matching filler.
1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.

3.3 FIELD QUALITY CONTROL

- A. Inspections: Provide inspection of installed Work through **AWI's Quality Certification Program** or **WI's Certified Compliance Program**] certifying that woodwork, including installation, complies with requirements of the Architectural Woodwork Standards for the specified grade.
1. Inspection entity shall prepare and submit report of inspection.

3.4 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets on exposed and semiexposed surfaces. Touch up finishes to restore damaged or soiled areas.

END OF SECTION

SOLID SURFACE

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 the following horizontal and trim solid surface product types:

- 1. Countertops with integral sinks, to be fabricated in one piece.**

- B. Related Sections include the following:

- 1. Division 6 Section "Rough Carpentry" for Blocking.
 - 2. Division 9 Section "Wall Cladding."
 - 3. Division 10 Section "Toilet Partitions."
 - 4. Division 15 Section "Plumbing Fixtures."
 - 5. Division 16 Section "Wiring Devices."

1.3 DEFINITION

- A. Solid surface is defined as nonporous, homogeneous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

1.4 SUBMITTALS

- A. Product data:

- 1. For each type of product indicated.

- B. Shop drawings:

- 1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
 - a. Show full-size details, edge details, thermoforming requirements, attachments, etc.
 - b. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.

- c. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items installed in solid surface.

C. Samples:

1. For each type of product indicated.
 - a. Submit minimum 4-inch by 4-inch sample in specified gloss.
 - b. Cut sample and seam together for representation of inconspicuous seam.
 - c. Indicate full range of color and pattern variation.
2. Approved samples will be retained as a standard for work.

D. Supplier and Product data:

1. Indicate product description, fabrication information and compliance with specified performance requirements.

E. Product certificates:

1. For each type of product, signed by product manufacturer.

F. Fabricator/installer qualifications:

1. Provide copy of certification number.

G. Maintenance data:

1. Submit manufacturer's care and maintenance data, including repair and cleaning instructions.
 - a. Maintenance kit for finishes shall be submitted.
2. Include in project closeout documents.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Shop that employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.

B. Fabricator/installer qualifications:

1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer.

C. Applicable standards:

1. Standards of the following, as referenced herein:
 - a. American National Standards Institute (ANSI)
 - b. American Society for Testing and Materials (ASTM)
 - c. National Electrical Manufacturers Association (NEMA)
 - d. NSF International

 2. Fire test response characteristics:
 - a. 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.
- D. Coordination drawings:
1. Shall be prepared indicating:
 - a. Plumbing work.
 - b. Electrical work.
 - c. Miscellaneous steel for the general work.
 - d. Indicate location of all walls (rated and non-rated), blocking locations and recessed wall items, etc.

 2. Content:
 - a. Project-specific information, drawn accurately to scale.
 - b. Do not base coordination drawings on reproductions of the contract documents or standard printed data.
 - c. Indicate dimensions shown on the contract drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements.
 - d. Provide alternate sketches to designer for resolution of such conflicts.
 - 1) Minor dimension changes and difficult installations will not be considered changes to the contract.
- E. Drawings shall:
1. Be produced in 1/2-inch scale for all fabricated items.
- F. Drawings must be complete and submitted to the architect within 60 days after award of contract for record only.
1. No review or approval will be forthcoming.

2. Coordination drawings are required for the benefit of contractor's fabricators/installers as an aid to coordination of their work so as to eliminate or reduce conflicts that may arise during the installation of their work.

G. Job mock-up:

1. Prior to fabrication of architectural millwork, erect sample unit to further verify selections made under sample submittals and to demonstrate the quality of materials and execution.
2. Mock-up shall be kitchen countertop and sink.
3. Build the mock-up to comply with the contract documents and install in a location as directed by the architect.
4. Notify the architect two weeks in advance of the date of when the mock-up will be delivered.
5. Should mock-up not be approved, re-fabricate and reinstall until approval is secured.
 - a. Remove rejected units from project site.
6. After approval, the mock-up may become a part of the project.
7. This mock-up, once approved, shall serve as a standard for judging quality of all completed units of work.

1.6 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.

1.7 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 years from date of substantial completion.

1.8 MAINTENANCE

- A. Provide maintenance requirements as specified by the manufacturer.

PART 2 — PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers:

1. Sheet Material to be Corian® surfaces from the DuPont company
2. Approved Equals prior to Bid.

2.2 MATERIALS

- 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 (.25 mm) shall be repairable by sanding and/or polishing.

- B. Thickness:

1. 1/2 inch

- C. Edge treatment:

1. As indicated

- D. Integral sink:

1. Model number:

- a. Refer to architectural and plumbing drawings

2. Color:

- a. Refer to architectural drawings.
- 3. Mounting:
 - a. Seamed under mount.

E. Backsplash:

- 1. Applied.

F. Sidesplash:

- 1. Applied.

2.3 ACCESSORIES

A. Joint adhesive:

- 1. Manufacturer's standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.

B. Sealant:

- 1. Manufacturer's standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone — any type), UL-listed silicone sealant in colors matching components.

2.4 FACTORY FABRICATION

A. Shop assembly

- 1. 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.
- 2. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.
 - a. Reinforce with strip of solid polymer material, 2" wide.
- 3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
- 4. Rout and finish component edges with clean, sharp returns.
 - a. Rout cutouts, radii and contours to template.
 - b. Smooth edges.
 - c. Repair or reject defective and inaccurate work.
- 5. Cut pieces to finished dimensions.

6. Sand edges and remove nicks and scratches.

2.5 FINISHES

- A. Select from the manufacturer's standard color chart.

1. Color:

- a. Dupont Corian®
- b. Approved equal prior to bid.

- B. Finish:

1. Provide surfaces with a uniform finish.
 - a. Matte; gloss range of 5–20.

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 INSTALLATION

- A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
 1. Provide product in the largest pieces available.
 2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
 - a. Exposed joints/seams shall not be allowed.
 3. 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.
 4. Cut and finish component edges with clean, sharp returns.
 5. Rout radii and contours to template.
 6. Anchor securely to base cabinets or other supports.

7. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.
 8. Carefully dress joints smooth, remove surface scratches and clean entire surface.
 9. Install countertops with no more than 1/8-inch (3 mm) sag, bow or other variation from a straight line.
- B. Coved backsplashes and applied sidesplashes:
1. Install applied sidesplashes using manufacturer's standard color-matched silicone sealant.
 2. Adhere applied sidesplashes to countertops using manufacturer's standard color-matched silicone sealant.
 3. Adhere to countertops using manufacturer's standard color-matched Joint Adhesive.

3.3 REPAIR

- A. Repair or replace damaged work that cannot be repaired to architect's satisfaction.

3.4 CLEANING AND PROTECTION

- A. Keep components clean during installation.
- B. Remove adhesives, sealants and other stains

END OF SECTION

FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to work specified in this section.

1.2 DEFINITIONS

- A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in, or construction joints between, fire rated wall and floor assemblies.

1.3 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

Only tested firestop systems shall be used in specific locations as follows:

- A. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.
- B. Openings between structurally separate sections of wall or floors.
- C. Gaps between the top of walls and ceilings or roof assemblies.
- D. Expansion joints in walls and floors.
- E. Openings and penetrations in fire-rated partitions or walls containing fire doors.
- F. Openings around structural members which penetrate floors or walls.

1.4 RELATED WORK OF OTHER SECTIONS

- A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:
 - 1. Section "Cast-In-Place Concrete"
 - 2. Section "Masonry"
 - 3. Section "Joint Sealants"
 - 4. Section "Gypsum Board Assemblies"
 - 5. Section "Plumbing"
 - 6. Section "HVAC"
 - 7. Section "Electrical"
 - 8. Section "Fire Alarm and Security"

1.5 REFERENCES

- A. Test Requirements: ASTM E 814, "Standard Method of Fire Tests of Through Penetration Fire Stops".
- B. Test Requirements: UL 1479, "Fire Tests of Through-Penetration Firestops"
- C. Test Requirements: UL 2079, "Tests for Fire Resistance of Building Joint Systems"
- D. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.
 - 1. UL Fire Resistance Directory:
 - a. Firestop Devices (XHJI)
 - b. Fire Resistance Ratings (BXRH)
 - c. Through-Penetration Firestop Systems (XHEZ)
 - d. Fill, Voids, or Cavity Material (XHHW)
 - e. Forming Materials (XHKU)
 - f. Joint Systems (XHBN)
 - g. Perimeter Fire Containment Systems (XHDG)
 - 2. Alternate Systems: "Omega Point Laboratories Directory" (updated annually).
- E. Test Requirements: ASTM E 1966, "Standard Test Method for Fire Resistive Joint Systems"
- F. Test Requirements: ASTM E 2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus"
- G. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops"
- H. ASTM E 84, "Standard Test Method for Surface Burning Characteristics of Building Materials"
- I. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments
- J. International Building Code: Current Edition
- K. NFPA 101 - Life Safety Code
- L. NFPA 70 - National Electric Code

1.6 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide through-penetration fire stop systems and fire-resistive joint systems that comply with specified requirements of tested systems.
- B. Fire stop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

- C. Proposed fire stop materials and methods shall conform to applicable governing codes having local jurisdiction.
- D. Fire stop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Contractor shall consult the Architect's Structural Engineer prior to penetrating any load bearing assembly.
- E. For those firestop applications that exist for which no qualified tested system is available through a manufacturer, an engineering judgment derived from similar qualified tested system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment documents must follow requirements set forth by the International Firestop Council.

1.7 SUBMITTALS

- A. General: Submittals shall be in accordance with Specification Section 01 33 00.
- B. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of qualified tested firestop systems to be used and manufacturer's installation instructions.
- C. Manufacturer's engineering judgment identification number and document details when no qualified tested system is available for an application. Engineering judgment must include both project name and contractor's name who will install firestop system as described in document.
- D. Submit material safety data sheets provided with product delivered to job-site.

1.8 INSTALLER QUALIFICATIONS

- A. Contractor to engage an experienced installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an installer engaged by the Contractor does not in itself confer qualification on the buyer.
- B. Single-Source Responsibility: All fire stopping to be performed by a single contractor who procures all fire stopping materials from a single source.**

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
- B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.
- C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.

- D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
- E. Do not use damaged or expired materials.

1.10 PROJECT CONDITIONS

- A. Do not use materials that contain flammable solvents.
- B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
- D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.
- E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

1.11 WARRANTY

- A. Provide manufacturer's standard warranty covering fire stopping materials.**
- C. Provide applicator's standard warranty covering workmanship for a period of one (1) year following substantial completion.**

1.12 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide fire stopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases as required by code.**
- B. Provide through-penetration fire stop systems with F ratings as determined per ASTM E 814/UL1479, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.**
- C. Provide joint sealants with fire-resistance as determined per ASTM E 1966/UL 2079, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.**
- D. For fire stopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.**
 - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, specify moisture-resistant through-penetration fire stop systems.**
 - 2. For penetrations involving insulated piping, specify through-penetration fire stop systems not requiring removal of insulation.**
- E. For fire stopping exposed to view, provide products with flame-spread values of**

less than 25 and smoke-developed values of less than 450, as determined per ASTM E 84

1.13 TEST CRITERIA

- A. Specify the materials listed above or approved equals shall meet the criteria herein.**
- B. Deflection: When tested in accordance with ASTM E759, the material shall not crack or delaminate when the non-concrete topped galvanized deck to which it is applied is subjected to a one time vertical centerload resulting in a downward deflection of 1/120th of the span.**
- C. Bond Impact: When tested in accordance with ASTM E760, the material shall not crack or delaminate from the concrete topped galvanized deck to which it is applied.**
- D. Cohesion/Adhesion (bond strength): When tested in accordance with ASTM E736, the material applied over uncoated or galvanized steel shall have an average bond strength of 150 psf.**
- E. Air Erosion: When tested in accordance with ASTM E859, the material shall not be subject to losses from the finished application greater than 0.025 grams per sq. ft. (0.27 grams per square meter).**
- F. Compressive Strength: When tested in accordance with ASTM E761, the material shall not deform more than 10 percent when subjected to a crushing force of 750 psf (35.9 kPa).**
- G. Corrosion Resistance: When tested in accordance with ASTM E937, the material shall not promote corrosion of steel.**
- H. Non-combustibility: When tested in accordance with ASTM E136 or CAN4-S114, the material shall be non-combustible.**
- I. Surface Burning Characteristics: When tested in accordance with ASTM E84 or CAN4-S102, the material shall exhibit the following surface burning characteristics:
 - 1. Flame Spread 0**
 - 2. Smoke Developed 0****
- J. Density: When tested in accordance with ASTM E605, the material shall meet the minimum individual and average density values as listed in the appropriate UL/ULC design or as required by the authority having jurisdiction, or shall have a minimum average of 15 pcf (240 kg/m³).**

1.14. INTUMESCENT FIRE PROTECTION SYSTEM

- A. Intumescent fire resistive material shall have been tested in accordance with the procedures of UL 263 or ASTM E119 or CAN/ULC-S101, and**

reported by Underwriters Laboratories, Inc. or Underwriters Laboratories of Canada only.

- B. Thin-Film Fire-Resistive Intumescent Mastic Coating shall be a Factory-mixed formulation.**
- C. Water-Based Formulation shall be approved by manufacturer and authorities having jurisdiction for indicated use.**
- D. Verify with manufacturer that products specified and selected are suitable for all intended uses.**
- E. UL Fire Tested Designs Only based on UL 263 (ASTM-E119).**
- F. No mesh is permitted.**
- G. Application of intumescent fire protection shall occur at exposed structural steel columns, diagonal braces, beams and all associated structural steel components as required by and applicable to the International Building Code.**

1.15. DECORATIVE TOPCOATING

- A. Topcoat materials shall be as required for color-coding, aesthetics or additional surface protection, approved by the thin-film fire resistive material manufacturer and applied in full accordance with the coating manufacturer's written instructions.**

PART 2 – PRODUCTS

2.1 FIRESTOPPING – GENERAL

- A. 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 the firestopping manufacturer based on testing and field experience.
- B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.
- C. Penetrations in Fire Resistance Rated Walls: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
 - 1. F-Rating: Not less than the fire-resistance rating of the wall construction being penetrated.
- D. Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
 2. T-Rating: when penetrant is located outside of a wall cavity, minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
- E. Penetrations in Smoke Barriers: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.
1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures.
- F. Mold Resistance: Provide penetration firestopping with mold and mildew resistance rating of 0 as determined by ASTM G21.
- G. **Further Requirements**
1. **Spray-applied fire resistive materials shall be applied at the required thickness and density to achieve the following ratings:**
 - a. **Composite Floor System (Spray Beams Only) 1 hour**
 - b. **Metal Decking at bottom of roof trusses) 1 hour**
 2. **Potable water shall be used for the application of spray-applied fire resistive materials.**
 3. **Spray-applied fire resistive materials shall be free of all forms of asbestos, including actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite. Material manufacturer shall specify certification of such upon request.**
 4. **Primers shall be approved by manufacturer and applied in full accordance with the primer manufacturer's written instructions.**
 5. **Compatibility: Provide fire stopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the fire stopping under conditions of service and application, as demonstrated by fire stopping manufacturer based on testing and field experience.**
 6. **Accessories: Provide components for each fire stopping system that are needed to install fill materials and to comply with "System Performance Requirements" article in Part 1. Use only components specified by the fire stopping 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:**
 - a. **Permanent forming/damming/backing materials including the following:**
 - i. **Semi refractory fiber (mineral wool) insulation.**
 - ii. **Ceramic fiber.**
 - iii. **Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.**
 - iv. **Fire-rated form board.**
 - v. **Joint fillers for joint sealants.**
 - b. **Temporary forming materials.**
 - c. **Substrate primers.**
 - d. **Collars.**
 - e. **Steel sleeves.**
 7. **Applications: Provide fire stopping systems composed of materials specified in this Section that comply with system performance and other requirements.**

2.2 FIREPROOFING MANUFACTURERS

- A. Provide products of the following manufacturers as identified below:
1. The spray-applied fire resistive material shall be manufactured by:
 - a. ISOLATEK INTERNATIONAL
 - b. W. R. GRACE CONSTRUCTION PRODUCTS
 - c. Hilti, Inc., Tulsa, Oklahoma
800-879-8000
www.us.hilti.com
 - d. Or Architect approved equal.
 2. Intumescent fire protection materials
 - a. CAFCO® BLAZE-SHIELD® II, Isolatek International (basis of design)
 - b. CAFCO® 300, Isolatek International
 - c. Monokote® MK-6, W. R. Grace

2.3 FIRESTOPPING MATERIALS

- A. Acceptable manufacturer: Tremco, Inc.**
- B. Proprietary Product(s)/System(s): Tremco Firestop Systems Products.**
1. **TREMstop IA+ High Performance Intumescent Acrylic Sealant**
 2. **TREMstop Acrylic Flexible Acrylic Sealant**
 3. **TREMstop Acrylic - SP Sprayable, Flexible Acrylic Sealant**
 4. **Fyre-Sil Fire Resistant Silicone Sealant**
 5. **Fyre-Sil S/L Self-Leveling Fire Resistant Silicone Sealant**
 6. **Dymeric 240/240FC Two Part Urethane Sealant**
 7. **Dymonic One Part Modified Polyurethane Sealant**
 8. **THC 900 Multi-Component Chemically Curing Polyurethane Sealant**
 9. **TREMstop Fire Mortar Trowelable Firestop Mortar**
 10. **TREMstop MCR Flexible Metal Restricting Collar for Wrap Strips**
 11. **TREMstop MP Moldable Putty Pad for Electrical Outlet Boxes**
 12. **TREMstop SuperStrip Flexible Intumescent Strip**
- C. Product(s)/System(s) Testing: UL Fire Resistance Directory, *Fill, Void or Cavity Materials (XHHW)* and *Firestop Devices (XHJI)* for listed product(s)/system(s).**

2.4 MATERIALS

- A. Use only firestop products that have been UL 1479, ASTM E 814 or UL 2079 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.
- B. Pre-installed firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and/or cable bundles penetrating concrete floors and/or gypsum walls.

- C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
1. Hilti Intumescent Firestop Sealant (FS-ONE) (Basis of Design)
 2. Hilti Flexible Firestop Sealant (CP 606)
 3. Or Architect approved equal.
- D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
1. Hilti Flexible Firestop Sealant (CP 606) (Basis of Design)
 2. Hilti Intumescent Firestop Sealant (FS-ONE)
 3. Or Architect approved equal.
- E. Sealants and caulking materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
1. Hilti Flexible Firestop Sealant (CP 606) (Basis of Design)
 2. Or Architect approved equal.
- F. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.
1. Hilti Speed Plugs (CP 777) (Basis of Design)
 2. Hilti Speed Strips (CP 767)
 3. Or Architect approved equal.
- G. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
1. Hilti Intumescent Firestop Sealant (FS-ONE) (Basis of Design)
 2. Or Architect approved equal.
- H. Intumescent sealants or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:
1. Hilti Intumescent Firestop Sealant (FS-ONE) (Basis of Design)
 2. Hilti Flexible Firestop Sealant (CP 606)
 3. Or Architect approved equal.
- I. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
1. Hilti Firestop Putty Pad (CP 617) (Basis of Design)
 2. Hilti Firestop Box Insert
 3. Or Architect approved equal.
- J. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:

1. Hilti Firestop Collar (CP 643N) (Basis of Design)
 2. Hilti Firestop Collar (CP 644)
 3. Or Architect approved equal.
- K. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
- L. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
1. Verify penetrations are properly sized and in suitable condition for application of materials.
 2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
 3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
 4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
 5. Do not proceed until unsatisfactory conditions have been corrected.

3.2 COORDINATION

- A. Coordinate construction of openings, penetrations and construction joints to ensure that the fire stop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through penetration fire stop systems. Coordinate construction and sizing of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- C. Coordinate fire stopping with other trades so that obstructions are not placed in the way prior to the installation of the fire stop systems.
- D. Do not cover up through-penetration fire stop and joint system installations that will become concealed behind other construction until each installation has been examined by the building inspector, per requirements of Section 109, International Building Code 2000, ed.

3.3 INSTALLATION

- A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.
- B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through penetration and construction joint materials.
 - 1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
 - 2. Consult with Architect's Mechanical Engineer and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
 - 3. Protect materials from damage on surfaces subjected to traffic.
- K. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
- L. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

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3.3 INSTALLATION

- A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.
- B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through penetration and construction joint materials.
 - 1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
 - 2. Consult with Architect's Mechanical Engineer and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
 - 3. Protect materials from damage on surfaces subjected to traffic.

END OF SECTION

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Latex joint sealants.

1.2 PRECONSTRUCTION TESTING

- A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
 2. Joint-sealant manufacturer and product name.
 3. Joint-sealant formulation.
 4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Preconstruction compatibility and adhesion test reports.
- C. Preconstruction field-adhesion test reports.
- D. Field-adhesion test reports.
- E. Warranties.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- B. Preinstallation Conference: Conduct conference at Project site.
- C. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.**
- D. Applicator Qualifications: Company specializing in performing work of this section with minimum three years documented experience, minimum three successfully completed projects of similar scope and complexity, and approved by manufacturer.**

1.6 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period. Provide signed copies.
 - 1. Warranty Period: 3 years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period. Provide signed copies.
 - 1. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Silicone sealants shall be provided for joints exposed to UV Light or joints subject to movement or joints intended to provide a weatherproof seal. Urethane sealants are not permitted to be used for these applications.**
- B. All joints in new construction requiring sealant shall be provided with a non adhesive backer rod.**
- C. All sealed joints shall be coordinated with other materials as required by the design to be compatible with the applicable construction.**
- D. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. **Tremco Sealant/Weatherproofing Division of RPM International, Inc.**
 - b. Approved equal prior to bid.
2. Type: Single component (S) or multicomponent (M).
3. Grade: Pourable (P) or nonsag (NS).
4. Class: 100/50.
5. Uses Related to Exposure: Nontraffic (NT).

2.2 LATEX JOINT SEALANTS

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Tremco Incorporated.
 - b. Approved equal prior to bid.

2.3 JOINT SEALANT BACKING

- A. 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.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

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.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

2.5 URETHANE SEALANTS

- A. **Multi-Component Urethane: ASTM C920, Type M, Grade NS, Class 50; Uses T, NT, M, A, and O; two component, chemical curing, nonstaining, nonbleeding, color as selected.**
 - 1. **Dymeric 240FC**
- B. **Single Component Urethane: ASTM C 920, Type S, Grade NS, Class 100/50, Uses NT, M, A, O; single component, moisture curing, nonstaining, non-bleeding, color as selected.**
 - 1. **Dymonic FC**
 - 2. **Dymonic.**
 - 3. **Vulkem 116.**
 - 4. **Vulkem 45.or Vulkem 45 SSL**
- C. **Multi-Component Self-Leveling Urethane: ASTM C920, Type M, Grade P, Class 25, Uses T; self leveling, multi-component, chemical curing, nonstaining, nonbleeding, color as selected.**
 - 1. **THC 900.**
 - 2. **THC 901.**
 - 3. **Vulkem 45 SSL + Catalyst (water = catalyst)**
- D. **Single Component Self-Leveling Urethane: ASTM C920, Type S, Grade P, Class 100/50; self leveling, single component, moisture curing, nonstaining, nonbleeding, color as selected, green concrete acceptable.**
 - 1. **Vulkem 45 SSL.**

2.6 SILICONE SEALANTS

- A. **Multi-Component Silicone: ASTM C920, Type M, Grade NS, Class 50; Uses NT, M, G, A and O: multi-component, neutral curing, nonstaining, nonbleeding, color as selected**
 - 1. **Spectrem 4-TS.**
- B. **Single Component Silicone: ASTM C920, Type S, Grade NS, Class 50; Uses NT, M, G, A and O: single component, neutral curing, nonstaining, nonbleeding, color as selected.**
 - 1. **Spectrem 1.**
 - 2. **Spectrem 2.**
 - 3. **Spectrem 3.**
- C. **Single Component Silicone: ASTM C920, Type S, Grade NS, Class 25; Uses NT, G, A and O: single component, neutral, nonstaining, nonbleeding, color as selected.**
 - 1. **Proglaze.**
 - 2. **Tremsil 200.**
 - 3. **Tremsil 600.**
- D. **Single Component Traffic Silicone: Low modulus, high performance, single component, self leveling sealant.**
 - 1. **Spectrem 800.**
 - 2. **Specterm 900SL.**

2.7. OTHER SEALANTS

- A. **Latex Sealant: ASTM C 834; single component, solvent curing, nonstaining, nonbleeding, nonsagging; color as selected.**
 - 1. Tremflex 834.
- B. **Synthetic Rubber Sealant:**
 - 1. Acoustical Sealant.
- C. **Butyl Sealant: ASTM C 1311, butyl or polyisobutylene, single component, nondrying, non-skinning, non-curing.**
 - 1. Butyl Sealant.

2.8 ACCESSORIES

- A. **Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.**
- B. **Primer: Non-staining type, recommended by sealant manufacturer to suit application.**
- C. **Joint Backing: Round foam rod compatible with sealant; oversized 25 to 50 percent larger than joint width; recommended by sealant manufacturer to suit application**
- D. **Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.**
- E. **Masking Tape: Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.**

2.9. SCHEDULE – SEALANT JOINTS

- A. **Exterior Sealant Joint [Type A]:**
 - 1. **Applications:**
 - a) **Control and expansion joints in cast-in-place concrete.**
 - b) **Joints between architectural precast concrete units.**
 - c) **Control and expansion joints in unit masonry.**
 - d) **Joints between different materials listed above.**
 - e) **Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.**
 - f) **Control and expansion joints in soffits and overhead surfaces.**
 - g) **Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified.**
 - 2. **Multi-Component Urethane Sealants:**
 - a) **Dymeric 240FC.**
 - 3. **Single Component Urethane Sealants:**
 - a) **Dymonic FC.**
 - b) **Dymonic.**
 - c) **Vulkem 116.**
 - 4. **Multi-Component Silicone Sealants:**
 - a) **Spectrem 4-TS.**
 - 5. **Single Component Silicone Sealants:**

- a) Spectrem 1.
- b) Spectrem 2.
- c) Spectrem 3.

B. Interior Sealant Joint [Type B]:

1. Applications:

- a) Control and expansion joints on exposed interior surfaces of exterior walls.
- b) Perimeter joints on exposed interior surfaces of exterior openings.
- c) Perimeter joints between interior wall surfaces and frames of interior doors, windows, storefronts, louvers, elevator entrances and similar openings.
- d) Other interior joints in vertical surfaces and non-traffic horizontal surfaces subject to movement for which no other sealant is specified.

2. Multi Component Urethane Sealants:

- a) Dymeric 240/240FC.

3. Single Component Urethane Sealants:

- b) Dymonic FC.

4. Single Component Silicone Sealants:

- a) Spectrem 1.
- b) Spectrem 2.
- c) Spectrem 3.

5. Other Sealants:

- a) Tremflex 834.

C. Traffic Sealant Joint [Type C]:

1. Applications:

- a) Control, expansion and isolation joints in cast-in-place concrete.
- b) Tile control and expansion joints.
- c) Joints between different materials listed above.
- d) Other interior and exterior traffic bearing joints in horizontal and sloped traffic surfaces

2. Multi Component Urethane Sealants:

- a) THC-900/901, self leveling.
- b) Vulkem 116 plus catalyst.(Vulkem 227)
- c) Vulkem 45 SSL plus catalyst

3. Single Component Urethane Sealants:

- a) Vulkem 45, self leveling.
- b) Vulkem 45 SSL, semi self leveling.

4. Single Component Silicone Sealants:

- a) Spectrem 800.
- b) Spectrem 900SL.

D. Interior Sanitary Sealant Joint [Type D]:

1. Applications:

- a) Joints in toilet room and bathroom counter tops.
- b) Joints between plumbing fixtures and adjacent materials.
- c) Other interior joints in wet areas where needed to limit mold and mildew growth.

2. Single Component Silicone Sealants:

- a) **Tremsil 200.**
- E. Concealed Metal Lap Sealant Joint [Type E]:**
 - 1. Applications:**
 - a) **Concealed lap and hook joints in sheet metal flashing and trim.**
 - 2. Single Component Non-Curing Sealants:**
 - a) **Tremco Butyl Sealant.**
 - b) **Tremco Acoustical Sealant.**
- F. Concealed Bedding Sealant Joint [Type F]:**
 - 1. Applications:**
 - a) **Bedding joints under metal thresholds and saddles.**
 - b) **Bedding joints between sheet metal flashing and other materials.**
 - 2. Single Component Urethane Sealants:**
 - a) **Dymonic FC.**
 - b) **Dymonic.**
 - c) **Vulkem 116.**
 - 3. Single Component Silicone Sealants:**
 - a) **Proglaze.**
 - b) **Spectrem 2.**
 - c) **Spectrem 3.**
 - 4. Single Component Non-Curing Sealants:**
 - a) **Tremco Butyl Sealant.**
 - b) **Tremco Acoustical Sealant.**

PART 3 - EXECUTION

3.1 PREPARATION

- A. **Surface Cleaning of Joints:** Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. **Joint Priming:** Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. **Masking Tape:** Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- F. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.
- G. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.
 - 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
- B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.4 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal surfaces.
 - 1. Joint Locations:
 - a. Control and expansion joints in unit masonry.
 - b. Joints between metal panels.
 - c. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - d. Control and expansion joints in ceilings and other overhead surfaces.
 - e. Other joints as indicated.
 - 2. Joint Sealant: Silicone.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
 - 1. Joint Locations:
 - a. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - b. Control and expansion joints in ceilings and other overhead surfaces.
 - c. Other joints as indicated.
 - 2. Joint Sealant: Silicone.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal surfaces.
 - 1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.

- c. Tile control and expansion joints.
 - d. Vertical joints on exposed surfaces of partitions.
 - e. Perimeter joints between interior wall surfaces and frames of interior doors windows and elevator entrances.
 - f. Other joints as indicated.
- 2. Joint Sealant: Latex.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal surfaces.
- 1. Joint Sealant Location:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 - c. Other joints as indicated.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes hollow-metal including work for hollow metal door and frames.

1.2 DEFINITIONS

- A. **Minimum Thickness:** Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 ACTION SUBMITTALS

- A. **Product Data:** For each type of product.
- B. **Shop Drawings:** Include elevations, door edge details, frame profiles, metal thicknesses, preparations for hardware, and other details.
- C. **Samples for Initial Selection:** For units with factory-applied color finishes.
- D. **Samples for Verification:** For each type of exposed finish required.
- E. **Schedule:** Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.

1.5 **QUALITY ASSURANCE**

- A. **AWI Quality Standard: "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute for grade of door, core, construction, finish, and other requirements.**
- B. **Fire-Rated Wood Doors: Specify wood doors that comply with NFPA 80; are identical in materials and construction to units tested in door and frame assemblies per ASTM E 152; and are labeled and listed by UL, Warnock Hersey, or another testing and inspection agency acceptable to authorities having jurisdiction.**
- C. **Single-Source Responsibility: doors required from one source and by a single manufacturer including non-rated and rated doors.**

- D. Door Manufacturer's Warranty: Provide a written agreement submitted on door manufacturer's standard form with an agreement to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch (6.35 mm) in a 42-by-84-inch (1067-by-2134-mm) section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span, or do not conform to tolerance limitations of referenced quality standards. Warranty shall be in effect during the following period of time after date of Substantial Completion. Solid Core Interior Door warranty shall be for the life of the installation.**
- E. Provide all rated doors and frames labeled according to listing requirements of Underwriter's Laboratories (UL).**
- F. Provide one of the acceptable manufacturers standard core materials according to SDI standards:**
 - 1. Vertical steel stiffeners.**
 - 2. Honeycomb**
 - 3. Polystyrene**
- G. Clearances for hollow metal doors and frames:**
 - 1. Jamb and Head: 1/8 inch, except not more than 1/4 inch**
 - 2. Between non-fire-rated pairs of doors. Not more than 3/4 inch at bottom.**
For fire doors, specify clearances according to NFPA 80.
- H. Exposed Fasteners: Provide countersunk flat or oval heads for exposed screws and bolts.**
- I. Thermal-Rated (Insulating) Assemblies: Provide doors fabricated as thermalinsulating door and frame assemblies at all exterior locations and as required to meet the design intent. Doors shall be tested according to ASTM C 236 or ASTM C 976.**
- J. Hardware Preparation: Provide doors and frames prepared to receive hardware. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.**
- K. All doors and frames shall be reinforced to receive surface-applied hardware.**

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:**
 - 1. Curries Manufacturing.**
 - 2. The Ceco Corp.**
 - 3. Mesker Industries, Inc.**
 - 4. Pioneer Industries.**

5. Republic Steel Corp.
6. Steelcraft Manufacturing Co.
7. Premier Steel Doors and Frames
8. Amweld Building Products, Inc.
9. Approved equal prior to bid.

2.2 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

2.3 INTERIOR DOORS AND FRAMES

- A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.
 1. Physical Performance: Level B according to SDI A250.4.
 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
 - d. Edge Construction: Model 1, Full Flush.
 - e. Core: Manufacturer's standard.
 3. Frames:
 - a. Materials: Uncoated, steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - b. Construction: Full profile welded.
 4. Exposed Finish: Prime.

2.4 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

- A. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. At all exterior door locations.
 1. Physical Performance: Level B according to SDI A250.4.
 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum A40 (ZF120) coating.
 - d. Edge Construction: Model 1, Full Flush.
 - e. Core: Manufacturer's standard insulation material.
 3. Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than $R = 1.4(U = 0.70)$ when tested according to ASTM C 1363.

Door to conform to requirements for Climate Zone 3 from the International Energy Conservation code.

4. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
 - b. Construction: Full profile welded.
5. Exposed Finish: Prime.

2.5 FRAME ANCHORS

A. Jamb Anchors:

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.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
4. Post-installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.6 MATERIALS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

- F. Power-Actuated Fasteners in Concrete: From corrosion-resistant materials.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
- H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).
- I. Glazing: Section 08 80 00 "Glazing."
- J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat.

2.7 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 - 1. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 - 2. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 2. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 - 3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 4. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 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. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - c. Compression Type: Not less than two anchors in each frame.
 - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
5. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
- a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
- 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
- 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 - 2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 - 3. Provide loose stops and moldings on inside of hollow-metal work.
 - 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.8 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 - 1. Shop Primer: SDI A250.10.

2.9 ACCESSORIES

- A. Louvers: Provide sightproof louvers for interior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch thick, cold-rolled steel sheet set into 0.032-inch thick steel frame.
 - 1. Fire-Rated Automatic Louvers: Movable blades closed by actuating fusible link, and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

2.10 FURTHER REQUIREMENTS (IN CASE OF A CONFLICT, THE FOLLOWING ARE TO TAKE PRECEDENCE)

A. HOLLOW METAL DOORS

- 1. **Materials shall meet the following requirements.**
 - a. **M A366A 366M or hot rolled, pickled and oiled steel conforming to ASTM A 569/A 569M. Steel shall be free of scale, pitting, coil breaks or other surface blemishes. Steel shall also be free of buckles, waves or any other defects caused by the use of improperly leveled sheets.**
 - b. **Exterior Doors: Face sheets shall be 14 gauge minimum thickness and shall have a zinc coating applied by the hot-dip process conforming to ASTM A 653/A 653/M. All exterior doors shall be insulated.**
 - c. **Interior Doors: Face sheets shall be 16 gauge minimum thickness. Where scheduled, face sheets of interior doors shall have a zinc coating conforming to ASTM A 653/A 653/M (A60).**
 - d. **ASTM A167, Type 316 stainless steel.**
- 2. **Specify that construction of hollow metal doors shall be as follows:**
 - a. **Door thickness shall be 1 3/4".**
 - b. **Doors shall be neat in appearance and free from warpage and buckle. All edge bends shall be true and straight and of minimum radius for the material used.**
 - c. **Door face sheets shall be joined at their vertical edges.**
 - d. **Door edges shall be joined by internally applied tack welds no more than 6" on center extending the full height of the door. There shall be a visible seam at both edges of the door.**
 - e. **Top and bottom edges of all doors shall be closed with continuous recessed steel channels no less than 16 gauge thickness, spot welded to both face sheets.**
 - f. **Exterior doors shall have an additional flush closing channel at the top edge. Where required for specified hardware, the bottom edge of exterior doors shall have an additional flush closing channel. Opening shall be specified in the bottom closure channel of exterior doors to permit the escape of entrapped moisture.**
 - g. **Edge profiles shall be specified on both vertical edges of door as follows:**
 - i. **Single-acting doors – beveled 1/8" in 2"**
 - ii. **Double-acting doors – rounded on 2-1/8" radius**
 - h. **All hardware for single-acting doors shall be designed for beveled edges.**

- i. **Hardware reinforcements:**
 - i. **Specify that doors shall be prepared in the factory to receive all hardware specified and approved by the County and to be in accordance with templates specified by the hardware supplier.**
 - ii. **Minimum thicknesses of hardware reinforcements shall be as follows:**
 - a) **Full mortise hinges & pivots: 10 gauge**
 - b) **Lock fronts, flush bolts, closers: 14 gauge**
 - c) **For all other Surface-mounted hardware: 16 gauge**
- j. **Glass moldings and stops:**
 - i. **If doors contain glass panels, doors shall be specified with flush moldings to secure glazing by others, in accordance with glass sizes and thicknesses shown on approved drawings.**
 - ii. **Fixed molding shall be securely welded to the door on the security side.**
 - iii. **Removable glass stop shall be no less than 20 gauge channel, with butted corner joints, and secured with #6 cadmium or zinc-plated countersunk sheet metal screws spaced 10" o.c. maximum.**
 - iv. **Require that the metal surfaces to which glazing stops are secured and the inside of the glazing stops be chemically treated for maximum paint adhesion and painted with a rust inhibitive primer prior to installation in the door.**
 - v. **Snap on moldings and surface applied light kits are not permitted.**
- k. **Louvers shall be factory installed flush type, and louver vanes shall be of the inverted vee type design. Louver vanes and louver channel shall be 18 gauge minimum thickness.**
- l. **Insect screens and/or bird screens shall be specified on louvered doors in exterior locations.**
- m. **At rated doors requiring louvers, specify a factory installed listed fire rated fusible link louver.**

B. HOLLOW METAL FRAMES

- 1. **Materials for hollow metal frames shall comply with the following standards:**
 - a. **Specify that frames be constructed of commercial quality, cold rolled steel conforming to ASTM A 366/A 366M or hot-rolled pickled and oiled steel conforming to ASTM A 569/A 569M.**
 - b. **Steel for exterior openings shall be 14 gauge, and shall have a zinc coating applied by the hot-dip process conforming to ASTM A 653/A 653M (A60).**
 - c. **Steel for interior openings shall be 16 gauge.**
 - d. **Steel for exterior openings subject to abuse shall be 14 gauge.**
- 2. **Construction:**
 - a. **All Hollow metal frames may be either knockdown for renovations and retrofits or welded type for new construction according to the design intent, with integral stops and trim.**
 - b. **All door frames in masonry construction shall be fully grouted.**
 - c. **Corner joints at welded corners shall have all contact edges closed tight, with faces mitered and continuously welded. Stops shall be butted.**
 - d. **Minimum height of stops shall be 5/8".**
 - e. **Hollow metal frames for multiple openings shall have mullion members.**
 - f. **Door Silencers: Except on weather stripped frames, all doors shall have 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.**

- g. **Plaster Guards: Specify minimum 0.0179-inch- (0.45-mm-) thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.**
- h. **Hardware reinforcements:**
 - i. **Specify that frames shall be prepared in the factory to receive all hardware specified and approved by the County and in accordance with templates specified by the hardware supplier.**
 - a) **Frames prepared for anchor hinges shall be reinforced only. Drilling and tapping of mounting holes shall be done in the field by the hardware installer.**
 - ii. **Minimum thickness of hardware reinforcing shall be as follows:**
 - a) **Hinge: 7 gauge x 1 –1/2" x 10" in length**
 - b) **Strike reinforcements: 12 gauge or 16 gauge extrusion**
 - c) **Flush bolt reinforcements: 12 gauge**
 - d) **Closer reinforcements: 12 gauge**
 - e) **Surface applied hardware reinforcements: 12 gauge**
- k. **Floor Anchors:**
 - i. **Floor anchors shall be specified with two holes. Fasteners shall be secured welded inside each jamb for anchorage to floor.**
 - ii. **Material thickness of floor anchors shall be 16 gauge.**
 - iii. **Floor anchors are not required for existing wall conditions. An additional frame anchor shall be specified in lieu of a floor anchor.**
- l. **Jamb Anchors:**
 - i. **Frames for installation in masonry walls shall be specified with adjustable jamb anchors of the T-strap or strap and stirrup type no less than 16 gauge; or wire type no less than 0.156" in diameter. Straps shall be no less than 2' x 10" in size, either perforated or corrugated. The number of anchors specified on each jamb shall be as follows:**
 - a) **Frames up to 60" height: 2 anchors**
 - b) **Frames greater than 60" up to 90" : 3 anchors**
 - c) **Frames greater than 90" up to 96": 4 anchors**
 - d) **Frames greater than 96" shall have 4 anchors plus one for each 24" or fraction thereof over 96", spaces 24" maximum between anchors.**
 - ii. **Welded frames for installation in stud partition shall be specified with 18 gauge steel anchors, secured inside each jamb as follows:**
 - a) **Frames up to 60" height: 2 anchors**
 - b) **Frames greater than 60" up to 90": 4 anchors**
 - c) **Frames greater than 90" up to 96": 5 anchors**
 - d) **Frames greater than 96" shall have 5 anchors plus one for each 24" or fraction thereof over 96", spaces 24" maximum between anchors.**
 - iii. **Frames for installation in pre-finished concrete, masonry or steel openings shall be specified with anchoring system of suitable design and quality. Fasteners for such anchors shall be specified as recommended by the manufacturer.**
 - iv. **Knock down frames shall be specified with a single adjustable tension anchor in each jamb and provision secure attachment of each jamb base to stud runners.**

- v. **The Architect shall verify anchor requirements with all UL listed frames prior to final specification.**
 - m. **Mortar guard shall be 26 gauge steel and shall be welded in place at all hardware mortises on frames to be set in masonry or concrete openings.**
 - i. **Mortar guards are not be required at hardware preparations in frames for drywall partitions.**
 - n. **All welded frames shall be specified with a temporary steel spreader welded to the bottom of jambs to serve as bracing during shipping and handling.**
 - o. **Removable Glazing Stops:**
 - i. **Removable glass stops shall be no less than 20 gauge channel, with butted corner joints, and secured with #6 cadmium or zincplated countersunk sheet metal screw spaced 10" o.c. maximum.**
 - ii. **The frames underneath the glazing stops and the inside of the glazing stop shall be treated for maximum paint adhesion and painted with a rust inhibitive primer prior to installation in the frame.**
3. **Clearances for hollow metal doors and frames:**
- a. **Jamb and Head: 1/8 inch, except not more than 1/4 inch**
 - b. **Between non-fire-rated pairs of doors. Not more than 3/4 inch at bottom. For fire doors, specify clearances according to NFPA 80.**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. **Hollow-Metal Frames:** Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
- 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install door silencers in frames before grouting.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - f. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 - 2. **Floor Anchors:** Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

- a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
 6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 7. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
 8. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- B. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
 - b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
 - c. At Bottom of Door: [3/4 inch (19.1 mm)] [5/8 inch (15.8 mm)] plus or minus 1/32 inch (0.8 mm).
 - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- C. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Requirements:

1. "Glazing" for glass view panels in flush wood doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts and louvers.
5. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.
7. Fire-protection ratings for fire-rated doors.

C. Samples: For factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

A. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is a certified participant in AWI's Quality Certification Program

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Algoma Hardwoods, Inc.
2. Ampco.
3. Chappell Door Co.
4. Graham Wood Doors; an Assa Abloy Group company.
5. Lambton Doors.
6. Marshfield Door Systems, Inc.
7. Mohawk Doors; a Masonite company.
8. VT Industries, Inc.
9. Approved equal prior to bid.

2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards.

1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.

C. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.

D. WDMA I.S.1-A Performance Grade:

1. Heavy Duty unless otherwise indicated.
2. Extra Heavy Duty: public toilets, janitor's closets, patient rooms, exits and assembly spaces.
3. Standard Duty: Closets (not including janitor's closets) and where indicated.

E. 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 or UL 10C.

1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
3. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

F. Structural-Composite-Lumber-Core Doors:

1. Structural Composite Lumber: WDMA I.S.10.
 - a. Screw Withdrawal, Face: 700 lbf (3100 N).
 - b. Screw Withdrawal, Edge: 400 lbf (1780 N).

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Custom (Grade A faces).
2. Species: **White Oak**.
3. Cut: Plain Sliced
4. Assembly of Veneer Leaves on Door Faces: **Random, must be continuous length from bottom of door to top of door, grain lines to run vertical. Trying to achieve a vertical stripe look on door face.**
5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
6. Core: Glued wood stave lumber.
7. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.

2.4 LIGHT FRAMES AND LOUVERS

- A. Wood-Veneered Beads for Light Openings in Fire-Rated Doors: Manufacturer's standard wood-veneered noncombustible beads matching veneer species of door faces and approved for use in doors of fire-protection rating indicated. Include concealed metal glazing clips where required for opening size and fire-protection rating indicated.
- B. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch thick, cold-rolled steel sheet; factory primed for paint finish; and approved for use in doors of fire-protection rating indicated.
- C. Metal Louvers:
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Air Louvers, Inc.
 - b. Anemostat; a Mestek company.
 - c. L & L Louvers, Inc.
 - d. Louvers & Dampers, Inc.; a division of Mestek, Inc.
 - e. McGill Architectural Products.
 - f. Approved equal prior to bid.
 2. Metal and Finish: Extruded aluminum with, Class II, color anodic finish, AA-M12C22A32/A34.

2.5 FABRICATION

- A. Factory machine doors for hardware that is not surface applied.
- B. Openings: Factory cut and trim openings through doors.
 - 1. Light 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 Section 08 80 00 "Glazing."
 - 3. Louvers: Factory install louvers in prepared openings.

2.6 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 finish doors that are indicated to receive transparent finish.
- C. Transparent Finish:
 - 1. Grade: **Custom.**
 - 2. Finish: **Two coats 2000 Water based Polyurethane.**
 - 3. Staining: **Two coats natural sealer.**
 - 4. Effect: **Open-grain finish.**
 - 5. Sheen: **Satin**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. 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.
- B. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.

- a. Comply with NFPA 80 for fire-rated doors.
- C. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION

ALUMINUM-FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior and interior storefront framing.
2. Storefront framing for punched openings.

1.2 PREINSTALLATION MEETINGS

- ##### A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

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

- ##### C. Shop Drawings: Include plans, elevations, sections, full-size details, and attachments to other work.

1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

- ##### D. Samples: For each exposed finish required.

- ##### E. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.

- ##### F. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- ##### A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.

- ##### B. Product test reports.

- ##### C. Field quality-control reports.

- ##### D. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC 17025.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. 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.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.
- D. **System Performance. Provide exterior entrance and storefront assemblies that have been designed and fabricated to comply with system performance characteristics listed below as demonstrated by testing systems according to test methods designated.**
 - 1. **Wind Loading. Provide capacity to withstand loading specified by structural design, tested in accordance with ASTM E 330.**
- E. **Provide transmission characteristics of fixed framing to comply with requirements indicated below.**
 - 1. **Air infiltration shall be not more than 0.06 CMF per square foot of fixed area in accordance with ASTM E 283.**
 - 2. **No uncontrolled water penetration shall occur at pressure differential of 6.24 psf in accordance with ASTM E 331 (excluding operable door edges).**
 - 3. **Condensation resistance shall be not less than 51 CRF in accordance with AAMA 1502.7.**
 - 4. **The specified thermal transmittance U-value shall comply with the currently enforced International Energy Conservation Code requirements.**
- F. **Provide transmission characteristics of entrances (doors with jamb and head frames) to comply with requirements indicated below.**
 - 1. **Air infiltration per linear foot of perimeter crack shall be not more than 0.50 CFM for single doors and 1.0 CFM for pairs of doors at pressure differential of 1.567 psf in accordance with ASTM E 283.**
 - 2. **Condensation resistance shall be not less than 48 CRF in accordance with**

AAMA 1502.7.

3. The specified thermal transmittance U-value shall comply with the currently enforced International Energy Conservation Code requirements.

- G. Installer Qualifications: The contractor to engage a firm who can provide evidence to indicate successful experience in the installation of work specified herein.**
- H. Welding Qualifications: Welding to comply with requirements of AWS D1.1 Structural Welding Code, for welding design, workmanship, techniques, inspection, and qualification of welding operators.**
- I. Provide separation between aluminum surfaces and sources of corrosion or electrolytic action, such as copper or untreated steel, by coating area of dissimilar metals with heavy-bodied bituminous paint.**
- J. For aluminum surfaces in contact with lime mortar or concrete, paint with alkali-resistant coating.**

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design aluminum-framed entrances and storefronts.
- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure including, but not limited to, story drift, twist, column

shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.

2. Where indicated on drawings provide "heavy duty/reinforced storefront". Coordinate these units with Delegated design requirements.
3. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.

C. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.

E. Structural: Test according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:
 - a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft.

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

H. Energy Performance: Certify and label energy performance according to NFRC as follows:

1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.35 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
2. Solar Heat Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.30 as determined according to NFRC 200.
3. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 35 as determined according to NFRC 500.

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 MANUFACTURERS

A. Basis-of-Design Product(Exterior): Subject to compliance with requirements, provide YKK AP America Inc; High Performance/Thermally Broken System to match existing storefront conditions or a comparable product by one of the following:

1. EFCO Corporation.
2. **Kawneer North America; an Alcoa company. Trifab 451-T (Basis of Design)**
3. Tubelite Inc.
4. Approved equal prior to bid.

B. Basis-of-Design Product(Interior): Subject to compliance with requirements, provide YKK AP America Inc Commercial System **to match existing storefront conditions** or a comparable product by one of the following:

1. EFCO Corporation.
2. **Kawneer North America; an Alcoa company. Trifab 451-T (Basis of Design)**
3. Tubelite Inc.
4. Approved equal prior to bid.

2.3 FRAMING

A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction Exterior: Thermally broken.
2. Construction Interior: Nonthermal.
3. Glazing System: Retained mechanically with gaskets on four sides.
4. Glazing Plane(Exterior): Front Set.
5. Glazing Plane(Interior): Center Set.
6. Finish: High-performance organic finish.
7. Fabrication Method: Field-fabricated stick system.

- B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Materials:
 - 1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - a. Sheet and Plate: ASTM B 209.
 - b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
 - c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
 - d. Structural Profiles: ASTM B 308/B 308M.
 - 2. 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.
 - a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 GLAZING

- A. Glazing: Comply with Section 08 80 00 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

2.5 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. 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.
- C. 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. Physical and thermal isolation of glazing from framing members.
 - 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 interior.
 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
 - E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
 - F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
 - G. 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.
 - H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.6 ALUMINUM FINISHES

- A. AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

Finish: **Refer to Exterior Material Keynote Schedule on Drawing A520 for color selection.**

2.7 FURTHER REQUIREMENTS

A. SOURCE QUALITY CONTROL

A single manufacturer or source shall provide materials of each type to ensure matching of quality, color, pattern and texture. Source or brands shall not be changed during the course of construction.

B. MATERIALS

1. **The basis of design of aluminum storefront system doors and frames shall be Standard Flush Glaze System as manufactured by Kawneer. Frames and door stiles shall be tubular extrusions with 1/8 inch minimum wall thickness.**
2. **Other approved manufacturers:**
 - a. **YKK**
 - b. **Vista Wall Series 3000**
3. **Swinging doors shall be Model 35D wide stile (6") doors.**
4. **Frames shall be 451-T.**
5. **Glazing stops shall be square type.**
6. **All exposed surfaces shall be free of scratches and other serious blemishes and shall receive Kynar 500 or be anodized.**
7. **Extrusions shall be 6063-T5 alloy and temper (ASTM B 221 alloy G.S. 10AT5). Fasteners, where exposed, shall be aluminum, stainless, steel, or plated steel in accordance with ASTM A 164. Perimeter anchors shall be aluminum or steel, providing the steel is property isolated from the aluminum. Glazing gaskets shall be elastomeric extrusions.**

- a. **The framing system shall provide for flush glazing on all sides with no projecting stops. Vertical and horizontal framing members shall have a nominal face dimension of 2". Overall depth shall be 4 1/2". Entrance framing members shall be compatible with glass framing in appearance. All single acting entrance frames shall include the Sealair positive barrier weathering.**

C. FABRICATION

1. **Provide the following requirements for shop assembly: Perform fitting and assembly of the work in the shop to the greatest extent possible. Work that cannot be permanently shop-assembled shall be completely assembled, marked, and disassembled before shipment, to assure assembly in the field. Require the following:**
 - a. **Preglazing: Preglaze door and frame units to greatest extent possible, in coordination with installation and hardware requirements.**
 - b. **Surface Mounted Hardware: Do not drill and tap for surface mounted hardware items until time of installation.**
 - c. **Welding: Comply with AWS recommendations.**

PART 3 - EXECUTION

3.1 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 and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed as specified in Section 07 92 00 "Joint Sealants" to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section "Glazing."

- G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
 - 1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
 - 2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.2 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts.
 - 1. Water-Spray Test(exterior only): 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.
 - a. Perform a minimum of two tests in areas as directed by Architect.
- C. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION

DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section includes:
 - 1. Door hardware for swinging doors.
- B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:
 - 1. Windows
 - 2. Cabinets (casework), including locks in cabinets
 - 3. Signage
 - 4. Toilet accessories
 - 5. Overhead doors
- C. Related Sections:
 - 1. Division 01 Section "Alternates" for alternates affecting this section.
 - 2. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.

1.03 REFERENCES

- A. UL - Underwriters Laboratories
 - 1. UL 10B - Fire Test of Door Assemblies
 - 2. UL 10C - Positive Pressure Test of Fire Door Assemblies
 - 3. UL 1784 - Air Leakage Tests of Door Assemblies
 - 4. UL 305 - Panic Hardware
- B. DHI - Door and Hardware Institute
- C. ANSI - American National Standards Institute
 - 1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
- D. Regulatory standards of the following as referenced:
 - 1. Department of Justice, Office of the Attorney General, Americans with Disabilities Act, Public Law 101-336 (ADA).

DOOR HARDWARE

2. CABO/ANSI A117.1: Providing Accessibility and Usability for Physically Handicapped People.

1.04 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.

B. Action Submittals:

1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
3. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:
 - a. Door Index; include door number, heading number, and Architects hardware set number.
 - b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
 - c. Type, style, function, size, and finish of each hardware item.
 - d. Name and manufacturer of each item.
 - e. Fastenings and other pertinent information.
 - f. Location of each hardware set cross-referenced to indications on Drawings.
 - g. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - h. Mounting locations for hardware.
 - i. Door and frame sizes and materials.
 - j. Name and phone number for local manufacturer's representative for each product.
 - k. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.
4. Key Schedule:
 - a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.

DOOR HARDWARE

- b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
 - 1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
 - f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
5. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
2. Certificates of Compliance:
 - a. Certificates of compliance for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
 - b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in "QUALITY ASSURANCE" article, herein.
3. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.
4. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data : Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 - e. Final approved hardware schedule, edited to reflect conditions as-installed.
 - f. Final keying schedule
 - g. Copies of floor plans with keying nomenclature
 - h. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
 - i. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.05 QUALITY ASSURANCE

- A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.

DOOR HARDWARE

1. Where specific manufacturer's product is named and accompanied by "No Substitute," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)
 - a. Where no additional products or manufacturers are listed in product category, requirements for "No Substitute" govern product selection.
 2. Where products indicate "acceptable manufacturers" or "acceptable manufacturers and products", provide product from specified manufacturers, subject to compliance with specified requirements and "Single Source Responsibility" requirements stated herein.
- B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
1. Warehousing Facilities: In Project's vicinity.
 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.
- D. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
 2. Can provide installation and technical data to Architect and other related subcontractors.
 3. Can inspect and verify components are in working order upon completion of installation.
- E. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
- F. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
- G. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
- H. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in "REFERENCES" article, herein.
- I. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.
1. Attendees: Owner, Contractor, Architect, Installer, and Supplier's Architectural Hardware Consultant.
 2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:

DOOR HARDWARE

- a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - b. Preliminary key system schematic diagram.
 - c. Requirements for key control system.
 - d. Requirements for access control.
 - e. Address for delivery of keys.
- J. Pre-installation Conference: Conduct conference at Project site.
- 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Inspect and discuss preparatory work performed by other trades.
 - 3. Review required testing, inspecting, and certifying procedures.
- K. Coordination Conferences:
- 1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
 - a. Attendees: Door hardware supplier, door hardware installer, Contractor.
 - b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- 1. Deliver each article of hardware in manufacturer's original packaging.
- C. Project Conditions:
- 1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
 - 2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- D. Protection and Damage:
- 1. Promptly replace products damaged during shipping.
 - 2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
 - 3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- F. Deliver keys to Owner by registered mail or overnight package service.

DOOR HARDWARE

1.07 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Direct shipments not permitted, unless approved by Contractor.

1.08 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
 - a. Closers: 25 years.
 - b. Locksets: 10 years.
 - c. Key Blanks: Lifetime
 - 2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.09 MAINTENANCE TOOLS

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- B. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- C. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

DOOR HARDWARE

- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fasteners

1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
 2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
 4. Install hardware with fasteners provided by hardware manufacturer.
- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 5BB series
2. Acceptable Manufacturers and Products: Hager, PBB

B. Requirements:

1. Provide five-knuckle, ball bearing hinges conforming to ANSI/BHMA A156.1.
2. Doors up to 36 inches wide provide standard weight steel-based hinges sized 4-1/2 inches high and 4-1/2 inches wide.
3. Doors 36 inches wide or more provide standard weight steel-based hinges sized 5 inches high and 4-1/2 inches wide.
4. Provide three hinges per door leaf for doors 90 inches or less in height, and one additional hinge for each 30 inches of additional door height.
5. Hinge Pins: Except as otherwise indicated, provide steel based hinge pins as follows:
 - a. Out-Swinging Lockable Doors: Non-removable pins
 - b. In-Swinging or Non-lockable Doors: Non-rising pins

2.04 SURFACE BOLTS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Trimco, Rockwood

DOOR HARDWARE

B. Requirements:

1. Surface bolts to have 1" throw for maximum security with concealed mounting that prevents vandalism. Units to be constructed of heavy duty steel and cUL listed up to three (3) hours when used on the inactive door of a pair up to 8' in height.

2.05 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Schlage ND Series
2. Acceptable Manufacturers and Products: Falcon T Series, Best 9K series

B. Requirements:

1. Provide cylindrical locks conforming to the following standards and requirements:
 - a. ANSI/BHMA A156.2 Series 4000, Grade 1.
 - b. UL 10C for 4'-0" x 10'-0" 3-hour fire door.
 - c. Florida Building Code (ASTM E330, E1886, E1996) and Miami Dade (TAS 201, 202, 203) requirements for hurricanes.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
 - a. Abusive Locked Lever Torque Test – minimum 3,100 inch-pounds without gaining access
 - b. Offset lever pull – minimum 1,600 foot pounds without gaining access
 - c. Vertical lever impact – minimum 100 impacts without gaining access
 - d. Cycle life - tested to minimum 16 million cycles per ANSI/BHMA A156.2 Cycle Test with no visible lever sag or use of performance aids such as set screws or spacers.
4. Provide solid steel anti-rotation through bolts and posts to control excessive rotation of lever.
5. Provide lockset that allows lock function to be changed to over twenty other common functions by swapping easily accessible parts.
6. Provide locks with standard 2-3/4 inches backset, unless noted otherwise, with 1/2 inch latch throw capable of UL listing of 3 hours on a 4' x 10' opening. Provide proper latch throw for UL listing at pairs.
7. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
8. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
9. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
10. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides. Lever Design: Schlage Boardwalk.

2.06 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Schlage
2. Acceptable Manufacturers: Falcon, Medeco, Sargent

B. Requirements:

DOOR HARDWARE

1. Provide cylinders, from the same manufacturer of locksets, compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
 - a. Conventional Open: cylinder with permanent core with open keyway
3. Nickel silver bottom pins.
4. Temporary Construction Cylinder Keying.
 - a. Provide construction cores that permit voiding construction keys without cylinder removal, furnished in accordance with the following requirements.
 - 1) Split Key or Lost Ball Construction Keying System.
 - 2) 3 construction control keys, and extractor tools or keys as required to void construction keying.
 - 3) 12 construction change (day) keys.
 - b. Owner or Owner's Representative will void operation of temporary construction keys.

2.07 KEYING

- A. Provide a new factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
- B. Requirements:
 1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
 - a. Master Keying system as directed by the Owner.
 2. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.
 3. Provide keys with the following features:
 - a. Material: Nickel silver; minimum thickness of .107-inch
 4. Identification:
 - a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication "Keying Systems and Nomenclature" for identification. Blind code marks shall not include actual key cuts.
 - b. Identification stamping provisions must be approved by the Architect and Owner.
 - c. Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE".
 - d. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
 - e. Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
 5. Quantity: Furnish in the following quantities to be confirmed with Owner.

DOOR HARDWARE

- a. Change (Day) Keys: 3 per cylinder/core.
- b. Master Keys: 6.

2.08 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer: Telkee
2. Acceptable Manufacturers: HPC, Lund

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
 - a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
 - b. Provide hinged-panel type cabinet for wall mounting.

2.09 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 1450 series
2. Acceptable Manufacturers and Products: Falcon SC80A series, Norton 8501/8501BF series

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
3. Closer Body: 1-1/4 inch diameter, with 5/8 inch diameter heat-treated pinion journal and full complement bearings.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
7. Pressure Relief Valve (PRV) Technology: not permitted.
8. Provide stick on and special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.10 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives

DOOR HARDWARE

2. Acceptable Manufacturers: Trimco, Don-Jp

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:
 - a. Kick Plates: 10 inches high by 2 inches less width of door on single doors, 1 inch less width of door on pairs
 - b. Mop Plates: 4 inches high by 2 inches less width of door on single doors, 1 inch width of door on pairs

2.11 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Glynn-Johnson
2. Acceptable Manufacturers: Rixson, ABH

B. Requirements:

1. Provide heavy duty and surface mounted overhead stop or holder as specified. Provide overhead stop for any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, where conditions do not allow wall stop or floor stop presents tripping hazard.

2.12 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Trimco, Burns

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.13 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International
2. Acceptable Manufacturers: National Guard, Reese

B. Requirements:

DOOR HARDWARE

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Size of thresholds:
 - a. Saddle Thresholds: 1/2 inch high by jamb width by door width
 - b. Bumper Seal Thresholds: 1/2 inch high by 5 inches wide by door width
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.14 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Trimco, Rockwood

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.15 FINISHES

A. Finish: BHMA 626/652 (US26D); except:

1. Protection Plates: BHMA 630 (US32D)
2. Overhead Stops and Holders: BHMA 630 (US32D)
3. Door Closers: BHMA 689 Powder Coat to Match
4. Wall Stops: BHMA 630 (US32D)
5. Weatherstripping: Clear Anodized Aluminum
6. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

DOOR HARDWARE

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- H. Lock Cylinders: Install construction cores to secure building and areas during construction period.
1. Replace construction cores with permanent cores as indicated in keying section.
- I. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- J. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
- K. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- L. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- M. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- N. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

3.03 FIELD QUALITY CONTROL

- A. Architectural Hardware Consultant: Engage qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
1. Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

DOOR HARDWARE

3.04 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.05 CLEANING AND PROTECTION

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

3.06 DEMONSTRATION

- A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.07 DOOR HARDWARE SCHEDULE

HW SET: 01

DOOR #(S):

201

EACH TO HAVE:

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY SET	ND40SI BRDWK OCC	626	SCH
1	EA	SURFACE CLOSER	1450 REG	689	LCN
1	EA	WALL STOP	WS406/407 CCV	630	IVE
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	488S-BK PSA	BK	ZER

HW SET: 02

DOOR #(S):

204

205

206

207

208

ALL HARDWARE BY WALL PARTITION MANUFACTURER. COORDINATE AND PROVIDE CYLINDERS IF REQUIRED.

DOOR HARDWARE

HW SET: 03

DOOR #(S):

209

EACH TO HAVE:

6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCKSET	ND50P6 BDWK	626	SCH
2	EA	SURFACE BOLT	SB360	626	IVE
1	EA	SURFACE CLOSER	1450A SHCUSH	689	LCN
1	EA	OH STOP	90H	630	GLY
1	EA	GASKETING	488S-BK PSA	BK	ZER
1	EA	MEETING EDGE SEAL	8150S-BK PSA	BK	ZER

HW SET: 04

DOOR #(S):

210

EACH TO HAVE:

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	OFFICE LOCKSET	ND50P6 BDWK	626	SCH
1	EA	SURFACE CLOSER	1450 REG	689	LCN
1	EA	OH STOP	90S	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488S-BK PSA	BK	ZER

END OF SECTION

DOOR HARDWARE

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Windows.
 - 2. Doors.
 - 3. Storefront.
 - 4. Interior borrowed lites.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 by a qualified professional engineer, using the following design criteria:
 - 1. Design Wind Pressures: As indicated on Drawings.
 - 2. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.
 - 3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- B. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.

1.3 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
 - 1. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.4 ACTION SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.

- C. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Preconstruction adhesion and compatibility test report.

1.6 QUALITY ASSURANCE

- A. 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. GANA Publications: GANA's "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. 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. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Fire-Resistive Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- E. **The Manufacturer is to provide the installer with specifications and installation instructions for each type of glazing sealant, gasket and associated miscellaneous material required. Manufacturer's published data, or letter of certification, or certified test laboratory report indicating that each material complies with the requirements and is intended generally for the specific application is also to be provided.**
- F. **The Manufacturer is to provide the installer with Material Data Indicating that glazing materials will withstand the forces specified in the design documents which shall include basis for determining wind loading criteria and indicate concurrence with glazing channel dimensions.**
- G. **Glass units shall be handled and stored in accordance with manufacturer's instructions.**

- H. **Specify that all glass installations shall be watertight and airtight installation of each piece of glass is required. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors) without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.**
- I. **Specify that glazing channels shall provide for necessary minimum bite on the glass, minimum edge clearance and adequate sealant thicknesses, within allowable tolerances. The installer is responsible for correct glass size for each opening, within the tolerances and necessary dimensions established.**
- J. **Specify that all glass shall be protected from edge at all times during handling, installation and operation of the building. Glass breakage during the warranty period will be considered a form of faulty material or workmanship (resulting from edge damage) unless known to result from vandalism or other causes not related to materials and workmanship.**
- K. **All glass shall bear the manufacturer's label to identify type, thickness and quality.**
- L. **Require that at a minimum all glass installations shall comply with published recommendations of glass product manufacturers and organizations below.**
 - 1. **FGMA Publications: "FGMA Glazing Manual."**
 - 2. **LSGA Publications: "LSGA Design Guide."**
 - 3. **SIGMA Publications: TM-3000 "Vertical Glazing Guidelines"**
- J. **Specify that all glass shall be a minimum 1/4 inch minimum thickness.**
- K. **Specify that all glass panels shall be field measured to fit in provided openings.**
- L. **Specify that the sizes for glass shall be measured and determined from the installed frames, doors and sash.**
- M. **Require that Workmanship shall be in accordance with the Standards of the Flat Glass Marketing Association Glazing Manual.**
- N. **Glass material shall be specified according to the following performance criteria:**
 - 1. **Light Transmittance**
 - 2. **Reflectance**
 - 3. **U Value**
 - 4. **Shading Coefficient**
 - 5. **Solar Heat Gain**

1.7 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: 10 years from date of Substantial Completion **provided in writing.**
- B. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which 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: 10 years from date of Substantial Completion **provided in writing.**
- C. **All units: Manufacturer's standard warranty that glass units supplied to Project will be free from defects in material and workmanship shall be provided.**

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. **PPG Industries (Basis of Design)**
 2. Old Castle
 3. ACG Flat Glass of North America
 4. Architect Approved Equal prior to bid.
- B. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
- C. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
 2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
- C. Silicone-Coated Spandrel Glass: ASTM C 1048, Condition C, Type I, Quality-Q3, and complying with other requirements specified.
 - 1. Glass: Clear float.
 - 2. Silicone Coating Color: **As selected by Architect from manufacturer's full range.**

2.3 INSULATING GLASS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. **PPG Industries (Basis of Design)**
 - 2. Old Castle
 - 3. ACG Flat Glass of North America
 - 4. Architect Approved Equal prior to bid
- B. **For insulated Glass Units, the following is required:**
 - 1. **All exterior glass shall be insulated glazing, including spandrel glass, full and partial lite glass doors.**
 - 2. **Insulating glass shall consist of two lites of glass with a hermetically and permanently sealed air space, and shall conform to Sealed Insulating Glass Manufacturer's Association (SIGMA) No. 65-7-2, "Sealed Insulating Glass Units."**
 - 3. **Exterior lite shall be 1/4 inch (6.0 mm) thick float glass and fully tempered where applicable.**
 - 4. **Interior glazing use clear glass, single lite and be fully tempered where applicable.**
 - 5. **Interior lite shall be 1/4 inch (6.0 mm) thick float glass and fully tempered where applicable.**
 - 6. **Air space shall be 1/2 inch (120 mm) Type B system.**
 - 7. **Insulated glass must be approved by the County for the intended use and shall meet the minimum requirements of the International Energy Conservation Code, currently adopted edition.**

2.4 FIRE-PROTECTION-RATED GLAZING

- A. Fire-Protection-Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on positive-pressure testing according to NFPA 257 or UL 9, including the hose-stream test, and shall comply with NFPA 80.
 - 1. Fire-protection-rated glazing required to have a fire-protection rating of 20 minutes shall be exempt from the hose-stream test.

- B. 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 permitted to be used in doors or openings; if permitted in openings, whether or not glazing has passed the hose-stream test; whether or not glazing meets 450 deg F (250 deg C) temperature-rise limitation; and the fire-resistance rating in minutes.
- C. Fire-Protection-Rated Tempered Glass: 6-mm thickness, fire-protection-rated tempered glass; and complying with 16 CFR 1201, Category II.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. AGC Glass Company North America, Inc.
 - b. SAFTI FIRST Fire Rated Glazing Solutions.
 - c. Technical Glass Products.
 - d. Vetrotech Saint-Gobain.
 - e. Approved equal prior to bid.
- D. Film-Faced Ceramic Glazing: Clear, ceramic flat glass; 5-mm thickness; faced on one surface with a clear glazing film; and complying with 16 CFR 1201, Category II.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. AGC Glass Company North America, Inc.
 - b. SAFTI FIRST Fire Rated Glazing Solutions.
 - c. Schott North America, Inc.
 - d. Technical Glass Products.
 - e. Vetrotech Saint-Gobain.
 - f. Approved equal prior to bid.

2.5 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.

2.6 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, 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.
 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
 4. **Glazing Compound: For metal frames, provide conformance with section "Glazing Materials" of the FGMA Glazing Manual. Compound used for glazing aluminum shall be pigmented with aluminum powder to match aluminum unit without staining or discoloring, shall be nonhardening and shall be a type not requiring painting.**
 5. **When flexible vinyl gasket channels are used, provide conformance with ASTM D 2287.**
 6. **Not Permitted: metal sash putty, non-skinning compounds, non-resilient type preformed sealers, and preformed impregnated type gaskets.**
 7. **Provide supplemental accessories to provide a complete installation, including glazing points, clips, shims, angles, heads, setting blocks and spacer strips.**
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

2.7 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 806.3 tape, for glazing applications in which tape is subject to continuous pressure.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

2.9 MONOLITHIC-GLASS TYPES (all interior locations)

- A. Glass Type: Clear fully tempered float glass.
1. Thickness: 1/4 inch (6.0 mm.)

2. Provide safety glazing labeling.
- B. Glass Type: Clear float glass.
1. Thickness: 1/4 inch (6.0 mm.)
 2. Provide safety glazing labeling.

2.10 INSULATING-GLASS TYPES (All exterior windows)

- A. **Glass Type: Solarban 70XL (2) Clear + Clear Insulating Glass Unit**
1. **Overall Unit Thickness: 1 inch (25 mm).**
 2. **Thickness of Each Glass Lite: 1/4 inch (6.0 mm.)**
 3. **Outdoor Lite: clear float glass, tempered as required per code with Solarban 70XL on second surface.**
 4. **Interspace Content: Air.**
 5. **Indoor Lite: clear float glass, tempered as required per code.**
 6. **VLT = 64%**
 7. **Exterior Reflectance = 12%**
 8. **Interior Reflectance = 13%**
 9. **U-Value Imperial (Winter) Air = 0.28**
 10. **SHGC = 0.27**
 11. **LSG = 2.37**
 12. **Provide safety glazing labeling.**
 13. **Note a butt glazed corner is to be provided at all exterior corner conditions.**

2.11 TEMPERED GLASS

- A. Tempered Glass shall follow ASTM C 1048, Type 1 (transparent, flat glass), Quality-03, provide kind FT (fully tempered) float glass in place of annealed float glass. Provide tempered glass in interior and exterior "hazardous" locations, which are defined to include, but not limited to (refer to latest code):
1. Any glazing in doors
 2. Any glazing within 24" of a door whose bottom edge is less than 60" A.F.F.,
 3. Any glazing which meets all of the four following characteristics:
 - a. Greater than 9 sq. ft. in area,
 - b. Bottom edge less than 18" A.F.F.
 - c. Top edge greater than 36" A.F.F.
 - d. Closer than 36" from an adjacent walking surface.

PART 3 - EXECUTION

3.1 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 glass lites where length plus width is larger than 50 inches (1270 mm).
- 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.

3.2 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Center glass lites in openings on setting blocks and press firmly against tape 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.

- F. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING

- 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.
- F. Glazing Sealants for Fire-Rated Glazing Products: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT. Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Dow Corning Corporation.
 - b. GE Construction Sealants; Momentive Performance Materials Inc.
 - c. Tremco Incorporated.
 - 2. Sealants shall have a VOC content of 250 g/L or less.
 - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

3.4 CLEANING AND PROTECTION

- A. Protect exterior 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.
- 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 buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Tile backing panels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- C. Samples: For each texture finish indicated on same backing indicated for Work.

1.3 QUALITY CONTROLS

- A. **Contractor to obtain each type of gypsum board, other panel products, and finishing materials from a single manufacturer.**
- B. **All gypsum assemblies shall be applied using screws. Nails are not permitted.**
- C. **All gypsum finishing shall be accomplished by vacuum sanding.**
- D. **All gypsum board patching to be from stud to stud.**
- E. **Interior gypsum assemblies at exterior walls shall be full height.**
- F. **Access panels shall be provided in all assemblies for any equipment or item requiring maintenance or periodic replacement.**

PART 2 - PRODUCTS

2.1 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.
 - 1. **Fire-Resistance Ratings shall comply with GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.**

- 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.

2.2 GYPSUM BOARD, GENERAL

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

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Wallboard: ASTM C 1396/C 1396M.

- 1. Manufacturers: **Gypsum board manufactured outside the Continental United States is not permitted.** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Georgia-Pacific Building Products.
- b. United States Gypsum Corporation.
- c. Quiet Solutions, Inc.
- d. National Gypsum Corporation.
- e. Approved equal prior to bid.

- 2. Thickness: 5/8 inch minimum or as indicated on drawings.
- 3. Long Edges: Tapered.

- B. Gypsum Board, Type X: ASTM C 1396/C 1396M. **Provide in all gypsum board locations, unless indicated otherwise.**

- 1. Thickness: **5/8 inch.**
- 2. Long Edges: Tapered.

- C. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

- 1. Thickness: **5/8 inch.**
- 2. Long Edges: Tapered.

- D. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces. To occur at all restroom locations. Refer to Drawings for locations.

- 1. Thickness: **5/8 inch Durock Cement Board Next Gen.**
- 2. Core: As indicated.
- 3. Long Edges: Tapered.
- 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

- E. Gypsum Board at Sound Wall Partitions

- 1. QuietRock 527 by Quiet Solution, Inc./Serious Energy, Inc. www.quietrock.com

- a. Edges: Tapered.
- b. Thickness: 5/8".
- c. Weight: 2.7 psf.

2.4 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Basis of Design: Georgia-Pacific Building Products, DensShield Tile Backer
 - b. United States Gypsum Corporation.
 - c. Quiet Solutions, Inc.
 - d. National Gypsum Corporation.
 - e. Approved equal prior to bid.
 2. Core: As indicated on Drawings.
 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
 2. Shapes:
 - a. **All control joints in wall or ceiling to be anodized aluminum drywall reveal molding.**
 - b. Cornerbead.
 - c. Bullnose bead.
 - d. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - e. L-Bead: L-shaped; exposed long flange receives joint compound.
 - f. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - g. Expansion (control) joint. **Provide at a minimum of every twenty feet (20'-0") in runs over twenty feet (20'-0") or as indicated on drawings.**
 - h. Curved-Edge Cornerbead: With notched or flexible flanges.
 3. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Fry Reglet Corporation.
 - b. Gordon, Inc.
 - c. Pittcon Industries.
 - d. Approved equal prior to bid.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified. Finish as noted.

2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 1. Interior Gypsum Board: Paper.
 2. 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: At open joints and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.
 6. **Drying-Type Joint Compounds for Gypsum Board shall be factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.**
 - a. **Ready-Mixed Formulation: Factory-mixed product.**
 - 1). **Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.**
 - 2). **Topping compound formulated for fill (second) and finish (third) coats.**
 - 3). **All-purpose compound formulated for both taping and topping compounds.**
- D. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
2. Cementitious Backer Units: As recommended by backer unit manufacturer.

E. **Reveal Molding detail:**

1. **For areas where gypsum board abuts different material as well as control joints in gypsum board (locations are on drawings) separate with a Fry Reglet reveal molding (www.fryreglet.com). Talk to architect about proper installation and reveal shapes. Material to be aluminum. Paint color of adjacent material.**

2.7 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
 3. **Install for full height of wall assembly.**
- E. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining 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. **Acoustic sealant shall be provided at the top and bottom, and around all penetrations of assemblies classified as "sound" or "acoustic" rated assemblies.**
 2. **Acoustical Sealant for Concealed Joints: Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.**
 3. **Sealant Products: Subject to compliance with these requirements, specify that the contractor shall provide one of the following:**
 - a. **Acoustical Sealant for Exposed and Concealed Joints:**
 - 1). **PL Acoustical Sealant; ChemRex, Inc.; Contech Brands.**
 - 2). **AC-20 FTR Acoustical and Insulation Sealant; Pecora Corp.**

- 3). **SHEETROCK Acoustical Sealant; United States Gypsum Co.**
- b. **Acoustical Sealant for Concealed Joints:**
 - 1). **BA-98; Pecora Corp.**
 - 2). **Tremco Acoustical Sealant; Tremco, Inc.**

F. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

- A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- B. Comply with ASTM C 840.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. 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.
- D. 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.
- E. Prefill open joints and damaged surface areas.
- F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- G. 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: **Panels that are substrate for tile.**
 - 3. Level 3: **Not used on this project.**
 - 4. Level 4: **At all wall panel surfaces that will be exposed to view**
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
 - 5. Level 5: **At mural walls. Refer to Drawings "Third Place East Elevation" and "Children's Computer Mural" on sheet A813 for locations.**
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- H. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.2 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.
 - 2. Bullnose Bead: Use where indicated.
 - 3. LC-Bead: Use at exposed panel edges.
 - 4. L-Bead: Use where indicated.
 - 5. U-Bead: Use where indicated.
 - 6. Curved-Edge Cornerbead: Use at curved openings.
 - 7. Custom shapes: where indicated.
- D. Exterior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.
 - 2. LC-Bead: Use at exposed panel edges.

3.3 Aluminum Trim: Install in locations indicated on Drawings.

3.4 FIRE BARRIER / SMOKE BARRIER / SMOKE PARTITION IDENTIFICATION

- A. Per intent of current edition of IBC Chapter 7: Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with stenciling. Such identification shall:
 - 1. **Contractor shall permanently identify all fire resistant rated walls (and corresponding fire resistant rating) including fire barrier walls, smoke barrier walls, fire partitions, fire walls, and shaft enclosures either by installing signs or by stenciling in concealed spaces the following: (() HOUR FIRE AND SMOKE BARRIER, PROTECT ALL OPENINGS), Identification shall be spaced not more than twelve (12) feet on center with a minimum letter size of two (2) inches in height on a contrasting background (SBC section 7035 of the 2003 Georgia State Amendments (Title 25 State Fire Marshal's Rules and Regulations Chapter 120.3.3).**

3.5 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION

TILING

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. Tile and trim.
 - 2. Thresholds.
 - 3. Waterproof membrane.
 - 4. Crack isolation membrane.
 - 5. Metal edge strips.

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. Module Size: Actual tile size plus joint width indicated.
- C. Face Size: Actual tile size, excluding spacer lugs.
- D. Wet Area: Tile surfaces that are either soaked, saturated, or regularly and frequently subjected to moisture or liquids (including water), such as gang showers, tub enclosures, showers, laundries, saunas, steam rooms, swimming pools, hot tubs, and exterior areas.

1.4 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - 1. Level Surfaces: Minimum 0.60.
 - 2. Step Treads: Minimum 0.60.
 - 3. Ramp Surfaces: Minimum 0.80.

1.5 SUBMITTALS

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

- C. 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.
- D. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
 - 1. 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 square, but not fewer than 4 tiles. Use grout of type and in color or colors approved for completed Work.
 - 2. Grout: Submit manufacturer's full range of standard and designated color samples.
- E. Product Certificates: For each type of product, signed by product manufacturer.
- F. Material Test Reports: For each tile-setting and -grouting product.
- G. Qualification Data: For qualified Installer.

1.6 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 - 1. Thresholds.
 - 2. Waterproof membrane.
 - 3. Crack isolation membrane.
 - 4. Joint sealants.
 - 5. Metal edge strips.
- D. Pre-installation Conference: Conduct pre-installation conference at the site.
 - 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.7 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.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.8 PROJECT CONDITIONS

- A. 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.

1.9 EXTRA MATERIALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

1.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.
- C. Low-Emitting Materials: Tile flooring systems 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."
- D. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory

and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

- E. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
 - 1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

1.2 PRODUCTS, MANUFACTURER

- A. Acceptable Manufacturer: **Trinity Tiles.**

- 1. Substitutions: In accordance with Division 1 Section "Substitution Procedures."

1.3 PRODUCTS, TILE

- A. Tile Type: Thru Color Porcelain, Floor and/or Wall Tile:

- 1. Series: **Refer to drawings.**
 - a. Composition: Thru Color Porcelain.
 - b. Module Size:
 - 1) **Refer to drawings**
 - c. Trim Tile:
 - 1) **Refer to drawings**
 - d. Color: **Refer to drawings.**
 - e. Water Absorption: Less than 0.50 percent per ASTM C373.
 - f. Coefficient of Friction:
 - 1) DCOF Wet Area: Minimum 0.42 per DCOF AcuTestSM
 - g. Frost Resistance: Resistant per ASTM C1026.

1.4 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

- 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.

- B. Refer to sheet I110 for required transition types.**

1.5 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

- B. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on

both sides with nonwoven polyester fabric; 0.030-inch nominal thickness.

1. Products: Subject to compliance with requirements, provide the following:
 - a. Noble Company (The); Nobleseal TS.

C. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch nominal thickness:

1. Products: Subject to compliance with requirements, provide the following:
 - a. Schluter Systems L.P.; KERDI.

D. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement:

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Laticrete International; 9235 Waterproofing and Anti-Fracture Membrane.

1.6 CRACK ISOLATION MEMBRANE

A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for high performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; 0.030-inch nominal thickness.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Noble Company (The); Nobleseal CIS.

C. Corrugated Polyethylene: Corrugated polyethylene with dovetail-shaped corrugations and with anchoring webbing on the underside; 3/16-inch nominal thickness.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Schluter Systems L.P.; Ditra.

D. Crack Isolation Membrane and Tile-Setting Adhesive: One-part, fluid-applied product intended for use as both a crack isolation membrane and tile-setting adhesive in a two-step process.

1.7 SETTING MATERIALS

A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.

1. Cleavage Membrane: Asphalt felt, ASTM D 226, Type I (No. 15); or polyethylene sheeting, ASTM D 4397, 4.0 mils (0.1mm) thick.
2. Reinforcing Wire Fabric: Galvanized, welded wire fabric, 2 by 2 inches by 0.062-inch diameter; comply with ASTM A 185 and ASTM A 82 except for minimum wire size.
3. Latex Additive: Manufacturer's standard water emulsion, serving as replacement

for part or all of gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement and aggregate mortar bed.

- B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bonsal American; an Oldcastle company.
 - b. Custom Building Products.
 - c. Laticrete International, Inc.
 - d. MAPEI Corporation.
 - 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
 - 3. Provide prepackaged, dry-mortar mix combined with [acrylic resin] [or] [styrene-butadiene-rubber] liquid-latex additive at Project site.
 - 4. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.
- C. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3.

1.8 GROUT MATERIALS

- A. Sand-Portland Cement Grout: ANSI A108.10, composed of white or gray cement and white or colored aggregate as required to produce color indicated.
- B. Standard Cement Grout: ANSI A118.6.
- C. Polymer-Modified Tile Grout: ANSI A118.7.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik, Inc.
 - b. Custom Building Products.
 - c. Laticrete International, Inc.
 - d. MAPEI Corporation.
 - e. Tex-Rite.
 - 2. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix. Basis of Design products include the following:
 - a. Laticrete 1600 Unsanded Grout with Laticrete 1776 Grout Enhancer.
 - b. Laticrete 1500 Sanded Grout with Laticrete 1776 Grout Enhancer.
 - c. Laticrete PermaColor Grout.
- D. Water-Cleanable Epoxy Grout: ANSI A118.3.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bostik, Inc.
 - b. Custom Building Products.
 - c. Laticrete International, Inc.
 - d. MAPEI Corporation.
 - e. Tex-Rite.

 2. Basis of Design:
 - a. **GRT-1:** (Wall / Floor Tile - High Performance Stain Resistant) Laticrete SpectraLOCK PRO (Part AB Liquid) with Laticrete SpectraLOCK Powder (Part C)
 - b. **GRT-1:** (Wall / Floor Tile - Industrial Grade) Laticrete 2000 Industrial Grout, if used on vertical joints 1/2" or greater LATAPOXY Part D Non-Sag Additive
 - c. **See finish legend for grout color.**
- 1.9 ELASTOMERIC SEALANTS
- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 07 Section "Joint Sealants."
 1. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints unless otherwise indicated.
 - B. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.
- 1.10 MISCELLANEOUS MATERIALS
- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
 - B. **Metal Edge Strips: Refer to interior transition details. Provide the basis of design for each of the following situations or a comparable product to be approved by the architect:**
 1. **Tile to Concrete: Basis of Design: Schluter Schiene extruded satin anodized aluminum transition strip**
 2. **Tile to Carpet: Basis of Design: Schluter Reno-TK Satin Anodized aluminum Transition Strip**
 3. **Carpet to LVT: Install each product according Interface installation standards to create tight joint without transition strip.**
 4. **Install ADA compliant thresholds at all exterior doors as appropriate for the condition.**
 - C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

- D. Grout Sealer: Manufacturer's standard[silicone] product for sealing grout joints and that does not change color or appearance of grout.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Bonsal American; an Oldcastle company; Grout Sealer.
 - b. Custom Building Products; Grout and Tile Sealer.
 - c. MAPEI Corporation; KER 003, Silicone Spray Sealer for Cementitious Tile Grout.

1.11 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' 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.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that concrete substrates for tile floors installed with thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
 - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
 - 3. 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.
 - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically

recommended by tile-setting material manufacturer.

- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 TILE INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For the following installations, follow procedures in the ANSI A108 Series of tile installation standards for providing 95 percent mortar coverage:
 - a. Exterior tile floors.
 - b. Tile floors in wet areas.
 - c. Tile swimming pool decks.
 - d. Tile floors in laundries.
 - e. Tile floors composed of tiles 8 by 8 inches or larger.
 - f. Tile floors composed of rib-backed tiles.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- E. Jointing Pattern: Lay tile in pattern as indicated on Drawings. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile, or as otherwise indicated on Drawings. Provide uniform joint widths unless otherwise indicated.

1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

F. Joint Widths:

1. Ceramic Mosaic Tile: 1/16 inch.
2. Paver Tile: [1/4 inch [3/8 inch.
3. Glazed Wall Tile: 1/16 inch.
4. Decorative Thin Wall Tile: 1/16 inch.

G. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

H. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

I. Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.

J. Metal Edge Strips: Install in locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

K. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 WATERPROOFING INSTALLATION

A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.

B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.5 CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.6 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter. Remove latex-portland cement grout residue from tile as soon as possible.
 - 1. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 - 2. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.7 TILE INSTALLATION SCHEDULE

- A. Exterior Floor Tile Installations:
 - 1. Tile Installation F102: thin set mortar [over waterproofing membrane] on concrete
- B. Exterior Wall Installation, masonry or Concrete:
 - 1. Tile Installation W202: thin-se mortar; TCS W202.
- C. Interior Floor Installations, Concrete Subfloor:
 - 1. Tile Installation F113: Thin-set mortar; TCA F113.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
 - 2. Tile Installation F115: Thin-set mortar; epoxy grout; TCA F115.
 - a. Thin-Set Mortar: Latex- portland cement mortar.

- b. Grout: Water-cleanable epoxy grout.
 - 3. Tile Installation F121: Cement mortar bed (thickset) on waterproof membrane; TCA F121 and [ANSI A108.1A] [ANSI A108.1B] [ANSI A108.1C].
 - a. Thin-Set Mortar for Cured-Bed Method: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
 - 4. Tile Installation F122: Thin-set mortar on waterproof membrane; TCA F122.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
 - 5. Tile Installation F125A: Thin-set mortar on crack isolation membrane; TCA F125A.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
- D. Interior Wall Installations, on Studs or Furring:
- 1. Tile Installation W243: Thin-set mortar on gypsum board; TCA W243.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded Polymer-modified unsanded grout.
 - 2. Tile Installation W245: Thin-set mortar on coated glass-mat, water-resistant gypsum backer board; TCA W245.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded Polymer-modified unsanded Water-cleanable epoxy grout.
- E. Bathtub/Shower Wall Installations, Metal Studs or Furring:
- 1. Tile Installation B419: Thin-set mortar on coated glass-mat, water-resistant backer board; TCA B419.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Polymer-modified unsanded Water-cleanable epoxy grout.
- F. Shower Receptor and Wall Installations, Concrete or Masonry:
- 1. Tile Installation B414: Cement mortar bed (thickset); TCA B414 and ANSI A108.1B .
 - a. Thin-Set Mortar for Cured-Bed Method: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded grout.
 - 2. Tile Installation B421: Thin-set mortar on waterproof membrane; TCA B421.
 - a. Thin-Set Mortar: Latex-portland cement mortar.
 - b. Grout: Polymer-modified sanded Polymer-modified unsanded grout.
- G. Shower Receptor and Wall Installations, Metal Studs or Furring:
- 1. Tile Installation B420: Thin-set mortar on coated glass-mat, water-resistant backer board; TCA B420.
 - a. Thin-Set Mortar: Latex- portland cement mortar.
 - b. Grout: Polymer-modified sanded Polymer-modified unsanded grout.

END OF SECTION

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Acoustical ceiling panels
 - 2. Exposed grid suspension system
 - 3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings
 - 4. Perimeter Trim
- B. Related Selections
 - 1. Section 09 2900 - Gypsum Board
 - 2. Divisions 23 - HVAC Air Distribution
 - 3. Division 26 - Electrical

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
 - 2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
 - 3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
 - 4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - 5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
 - 6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
 - 7. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
 - 8. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - 9. ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material
 - A. Armstrong Fire Guard Products
 - 10. ASTM E 580 Installation of Metal Suspension Systems in Areas Requiring Moderate Seismic Restraint
 - 11. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems

- 12. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
- 13. ASTM E 1264 Classification for Acoustical Ceiling Products
- B. International Building Code
- C. ASHRAE Standard 62.1-2004, Ventilation for Acceptable Indoor Air Quality
- D. NFPA 70 National Electrical Code
- E. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
- F. International Code Council-Evaluation Services - AC 156 Acceptance Criteria for Seismic Qualification Testing of Non-structural Components
- G. International Code Council-Evaluation Services Report - Seismic Engineer Report
 - 1. ESR 1308 - Armstrong Suspension Systems
- H. International Association of Plumbing and Mechanical Officials - Seismic Engineer Report
 - 1. 0244 - Armstrong Single Span Suspension System

1.3 SYSTEM DESCRIPTION

- A. Continuous/Wall-to-Wall

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
- C. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
- D. Shop Drawings: Layout and details of acoustical ceilings show locations of items that are to be coordinated with, or supported by the ceilings.
- E. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.
- F. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

1.5 QUALITY ASSURANCE

- A. **Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.**
 - 1. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 - 2. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 Classification.
 - 3. Fire Resistance: As follows tested per ASTM E119 and listed in the appropriate floor or roof design in the Underwriters Laboratories Fire Resistance Directory
- B. Acoustical Panels: As with other architectural features located at the ceiling, may obstruct or skew the planned fire sprinkler water distribution pattern through 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.
- C. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.
- D. **Certified Installer shall have not less than three (3) years of successful experience in the installation of ceiling suspension systems on projects with requirements similar to requirements specified.**

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical ceiling units 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 acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.7 PROJECT CONDITIONS

- A. Space Enclosure:
Standard Ceilings: Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

1.8 WARRANTY

- A. Acoustical Panel: 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 the following:
 - 1. Acoustical Panels: Sagging and warping
 - 2. Grid System: Rusting and manufacturer's defects
- B. Warranty Period:
 - 1. Acoustical panels: One **(30) years** from date of substantial completion.
 - 2. Cirrus: Ten **(30) years** from date of substantial completion.
 - 3. Grid: One **(30) years** from date of substantial completion.
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.9 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.
 - 2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

1.10 PERFORMANCE

- A. **Acoustic Panels shall meet the following standards:**
 - a. **Acoustical Tile Standard: Manufacturer's standard tiles shall be of configuration that complies with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance values.**
- B. **Acoustic Panels shall meet the following standards regarding fire performance characteristics:**
 - a. **Surface-Burning Characteristics: All Acoustical panels must comply with ASTM E 1264 for Class "A" materials, when tested per ASTM E 84.**
 - b. **Fire-Rated Assembly: Design fire-rated ceiling systems according to tested firerated design.**
 - c. **Design acoustical tile ceilings to comply with ASTM C 636, UL fire-rating classification, UBC Standard 25-2 and seismic design requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."**
- C. **Acoustic Panels shall meet the following standards regarding performance characteristics for bacteria and mold growth:**
 - a. **Specify acoustical tiles treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gramnegative bacteria and showing no mold, mildew, or bacterial growth when**

tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Ceiling Panels:

1. Basis of Design: **Armstrong World Industries, Inc.**
2. Approved equal prior to bid.

B. Suspension Systems:

1. Basis of Design: **Armstrong World Industries, Inc.**
2. Approved equal prior to bid.

C. Perimeter Systems

1. Basis of Design: **Armstrong World Industries, Inc.**
2. Approved equal prior to bid.

2.2 ACOUSTICAL CEILING UNITS

A. Acoustical Panels, Basis of Design: Armstrong Optima Square Tegular. Refer to architectural reflected ceiling plan for locations of acoustical panel ceiling types.

Provide panels as follows:

1. Type ACT-1: 24" x 24"

**Armstrong Optima Square Tegular
Surface Texture: Fine
Composition: Mineral Fiber
Color: White**

2. Type ACT-2: 24" x 24"

**USG Boral Soundblock
Surface Texture: Perforated
Composition: Gypsum
Color: White**

***Note: Use with manufacturer's ceiling grid suspension system**

3. Type ACT-3: 24" x 72"

**Armstrong Optima Square Tegular
Surface Texture: Fine
Composition: Mineral Fiber
Color: White**

B. Edge Profile: Tegular 15/16IN for interface with Prelude XL 15/16" Exposed Tee grid.

2.3 METAL SUSPENSION SYSTEMS

- A. Components: Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.
 - 1. Structural Classification: ASTM C 635 Intermediate Duty
 - 2. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
 - 3. Acceptable Product: Prelude XL 15/16" Exposed Tee as manufactured by Armstrong World Industries
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft annealed, with a yield stress load of at least time three design load, but not less than 12 gauge.
- D. Edge Moldings and Trim:
7800 - 12ft Wall Molding

2.4 ADDITIONAL REQUIREMENTS

- A. **Specify extra material in full size units equal to 5.0 percent of quantity installed of ceiling panel and suspension system described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.**
- B. **Provide all Seismic bracing required per code.**
- C. **Gypsum wallboard bulkheads are allowed and should be clearly indicated on the reflected ceiling plans and detailed to show bracing conditions. Bulkheads constructed using the Acoustic Panel Ceiling System are not permitted.**
- D. **All ceiling tiles shall be square and installed in an orthogonal direction to the space under consideration.**
- E. **All ceiling tiles shall be centered in the room and in corridors. Limit partial tiles to 12 inches or greater.**
- F. **All lighting, ceiling mounted devices, and sprinkler heads shall be centered in ceiling tiles.**
- G. **Provide hold down clips for all tiles within areas where security is a primary concern. Verify all areas in question with the County prior to specification. Hold-down clips shall be compatible with ceiling panels specified. Specify minimum 12 ga., galvanized, softannealed, mild steel hanger wire, 18 ga., galvanized, annealed steel tie wire. Prefabricated metal clamps for fastening to building structure. 16 ga. cold-rolled steel, carrying channels, 1-1/2" deep.**
- H. **Do not support ceilings from ductwork, conduit, sprinkler piping, or any other equipment**

located in a plenum or above the finished ceiling. All wire ties must extend to structure above. Do not support any equipment load from the ceiling grid. Space hanger wires on main tees a maximum of 48" on center attaching hangers directly to structure above. A hanger wire shall occur directly adjacent to the fire expansion notch on every main tee, and as required by Code or the local jurisdiction. Provide additional hanger wires where lighting fixtures and/or air supply and return units occur in ceiling.

- I. Size attachment devices for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.**
- J. Edge Moldings shall be nominal 9/16" x 15/16" hemmed, prefinished angle molding, screw attached at intervals at not less than sixteen inches (16") on center and not more than three inches (3") from the end.**
- K. Exposed fasteners and pop rivets are not permitted.**
- L. Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.**
- M. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations A12-160GSB/12-2012 095000-3 finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.**

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
- B. 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.

3.3 INSTALLATION

- A. Follow manufacturer installation instructions.

- B. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.
- C. Suspend main beam from overhead construction with hanger wires spaced 4'-0" on center along the length of the main runner. Install hanger wires plumb and straight.
- D. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.
- E. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
- F. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.4 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. 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 any ceiling products that cannot be successfully cleaned and or repaired. Replace with attic stock or new product to eliminate evidence of damage.
- C. Before disposing of ceilings, contact the Armstrong Recycling Center at 877-276-7876, select option #1 then #8 to review with a consultant the condition and location of building where the ceilings will be removed. The consultant will verify the condition of the material and that it meets the Armstrong requirements for recycling. The Armstrong consultant will provide assistance to facilitate the recycle of the ceiling.

END OF SECTION

TILE CARPETING

PART 1 – GENERAL

1.01 SUMMARY

- A. Related Documents: Drawings and general provisions of the Contract.
- B. As part of the institution's sustainability strategy, the owner intends to create a circular economic for as much of its facilities supply chain as possible. A key part of that circular economic model includes the owner's plans to recycle 100% of their existing and future plastic flooring inventory as it becomes available for replacement. Depending on the deferred maintenance cycle (10-15 years), the effort will result in the institution moving the physical footprint to a carbon free, glue free, floor prep free, incineration free flooring program.
- C. The owner recognizes the existence of embodied carbon inside building materials and is intent on working to lower those Scope 3 emissions whenever possible.
- D. The successful manufacturer will have implemented a focused and systematic effort to reduce their overall environmental footprint. In order to eliminate greenwash, the manufacturer must be able to clearly articulate their company-wide goals and achievements with specific performance against historical benchmarks.
- E. Execution of this circular economic model will result in the elimination of tons of carbon emissions, carpet landfill burden, constructive use of tons of additional recycled content, the elimination of glue buckets and reduced floor prep expenses.
- F. This is a *non-proprietary* specification. However, owner reserves the right to analyze all products using metrics that truly matter, and ultimately use the most environmentally friendly alternative submitted.

1.02 SUBMITTALS

- B. Shop drawings shall be submitted to Architect/Owner for approval prior to installation of floor. Randomly installed modular products are preferred due to elimination of dye lots, minimization of waste and ease of repair/replacement. Manufacturer will inform Architect/Owner of projected trim waste on project prior to bid. Copy of approved shop drawings to be available on job site during installation.
- C. Floor schedule using same room designations indicated on drawings.
- D. Product Data: Provide data on specified products, describing physical and performance characteristics, sizes, patterns, colors available, method of installation and sustainability attributes.
- E. Verification Samples: Submit samples illustrating color and pattern for each carpet material specified.

- F. Manufacturer's Installation Instructions
- G. Maintenance Data: Include maintenance procedures, recommendations for maintenance materials and equipment, suggested schedule for cleaning and include any information relative to water use, contamination and runoff.
- H. Manufacturer's Product Warranty: **15 years from date of Substantial Completion.**
- I. Carbon Neutral Certificate stating how many tons of embodied CO2 are sequestered.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications

1. Company specializing in manufacturing specified carpet with minimum 15 years documented experience in the production of modular carpet.
2. Upon request, manufacturer to provide representative to assist in project start-up and to inspect installation while in process and upon completion. Representative will notify designated contact if any installation instructions are not followed.
3. Manufacturer must provide verification of its registration to the ISO 9001 Quality Management System
4. Manufacturer must state (as a submittal) their total company's improvement of, or reduction in the following environmental categories (global footprint), over the last ten years minimum:
 - a) Product carbon footprint
 - b) Overall energy reduction
 - c) Percent of renewable energy used (of total energy consumption)
 - d) GHG emissions at all manufacturing sites
 - e) Raw materials from bio-based or recycled materials
 - f) Water Use
 - g) Post-consumer carpet diverted from landfill
 - h) Manufacturing waste sent to landfill

B. Installer Qualifications

1. Flooring contractor to be a specialty contractor normally engaged in this type of work and shall have prior experience in the installation of these types of materials.
2. Flooring contractor possessing Contract for the product installation shall not sub-contract the labor without written approval of the Project Manager.
3. Flooring contractor will be responsible for proper product installation, including floor testing and preparation as specified by the manufacturer.

5. Flooring contractor to provide Owner a written installation warranty that guarantees the completed installation to be free from defects in materials and workmanship for a period of one year after job completion.
6. Flooring contractor to provide Owner a report of all recycling activity.

1.04 DELIVERY, STORAGE, & HANDLING

- A. Deliver materials to the site in manufacturer's original packaging listing manufacturer's name, product name, identification number, and related information.
- B. Store in a dry location, between 65 degrees F and 90 degrees F and a relative humidity below 65%. Protect from damage and soiling.
- C. Make stored materials available for inspection by the Owner's representative.
- D. Store materials in area of installation for minimum period of 48 hours prior to installation.

1.05 PROJECT CONDITIONS

- A. Sub-floor preparation is to include all required work to prepare the existing floor for installation of the product as specified in this document and Manufacturer's installation instructions.
- B. All material used in sub-floor preparation and repair shall be recommended by the carpet manufacturer and shall be chemically and physically compatible with the carpet system being bid.
- C. Maintain minimum 65 degrees F ambient temperature and 65% Relative Humidity for 72 hours prior to, during, and 48 hours after installation.
- D. Do not install flooring until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.

1.06 EXTRA MATERIALS

- A. Provide additional 5% carpet for "attic stock"

PART 2 – PRODUCTS

1.01 RECYCLED CONTENT

- A. The highest post-consumer recycled content is preferred in both backing and fiber. If post-consumer content is not available, consideration will be given to the product with highest post-industrial content.
- B. Manufacturer must clearly itemize the amount of post-consumer content v. post-industrial content.

- C. Recycled content must be certified by a neutral, independent, third party organization

1.02 RECYCLABILITY & RECYCLING PROGRAM

- A. Product should be one hundred percent (100%) closed-loop recyclable back into flooring.
- B. Flooring must be installed glue free without full spread wet adhesives to prevent backing contamination and allow for "clean recycling". Products whose removal requirements or processes may damage sub-floor will not be considered.
- C. Manufacturer must maintain and operate a recycling effort capable of reclaiming and recycling 100% of installed carpet. First choice is repurposing, provided carpet is in usable condition. Second choice is closed loop recycling turning carpet into carpet. Third choice is waste to energy. In all cases, landfill is the last alternative is landfill. A written plan, in accordance with this options, must be approved by owner in writing prior to award.

2.04 PRODUCT WARRANTY

- A. Warranty to be sole source responsibility of the Manufacturer.
- B. If the product fails to perform as warranted when properly installed and maintained, the affected area will be repaired or replaced at the discretion of the Manufacturer.
- C. Chair pads should not be required as a condition of warranty.
- D. Warranty shall not exclude carpet product installed on stairs provided it is properly installed and maintained.
- E. The 15 year non-prorated warranty shall specifically warrant:
 - 1. Against loss of more than 10% by weight of face fiber
 - 2. Against edge ravel, backing separation, shrinking, stretching, cupping, doming and
 - 3. Against excessive static electricity
 - 4. Antimicrobial effectiveness.
 - 5. 100% solution dyed yarns against excessive color loss

2.05 FIBER

- A. Nylon Fiber: 100% Solution Dyed Bulked Continuous Filament (BCF) Nylon Type 6 or Type 6,6
- B. Modification ratio of 2.2 or less.

- C. Carpet with yarn dyed (100% or blends), piece-dyed or printed fiber should be avoided due to potential loss of color and unnecessary water usage, resulting effluents and energy consumed in manufacturing process.
- D. 100% non-virgin fiber is preferred.
- E. Stain inhibitor should be applied to the fiber during fiber manufacturing to resist staining and soiling.

2.06 BACKING CHARACTERISTICS

- A. Backing should be inherently stable, free lay and require little to no wet adhesion applied to subfloor, thereby eliminating any future floor preparation expenses for the owner. The product should be installed without glue such that backing contamination does not occur and easy removal, reclamation and clean recycling into new carpet tile can be expedited.
- B. Primary Backing: Non-woven synthetic, latex and preservative protection
- C. Secondary Backing: Thermoplastic with fiberglass reinforcement. An operational recycling technology of this backing system must be in place and commercially available for consideration.
- D. Product Size: 50cm by 50cm, 1m by 50cm, 1m by 25 cm, 1m by 1m. All products must be interchangeable inside a consistent grid: soft & hard surface
- E. Impervious to moisture
- F. No delamination

2.02 PERFORMANCE CHARACTERISTICS

- A. Test reports for the following performance assurance testing to be submitted upon request.
Submitted results shall represent average results for production goods of the referenced style. Requirements listed below must be met by all products.

1. Flooring Radiant Panel
ASTM E-648 / NFPA 253: Class 1 (CRF: 0.45 watts/sq cm or greater)
2. Federal Flammability
CPSC FF 1-70: Passes
3. Smoke Density
ASTM E-662 / NFPA 258: < 450 Flaming Mode
4. Electrostatic Propensity
AATCC 134 (Step & Scuff): 3.0 kV or less
5. Lightfastness
AATCC 16E: 4 @ 100 hours solution dyed
6. TARR
3.0 Minimum
7. Dimensional Stability
ISO 2551/ASTM D 7570 Dimensional Stability <.10%

2.03 PRODUCT MANUFACTURING SPECIFICATIONS

Shelby Eanes

Account Executive

Shelby.Eanes@interface.com | mobile 470-698-4508

Interface® | 1280 W Peachtree St NW | Atlanta, GA 30309 | interface.com

800-634-6032 customer service

Manufacturer will meet the following construction requirements:

- A. Construction: Tufted
- B. Gauge: 12th Gauge
- C. Dye Method: 100% Solution Dyed
- D. Dye Lots: Guaranteed mergeable
- E. Preservative: Permanent, organically based, compounded in primary backing layer
- F. Carbon Footprint: Neutral, as certified by 3rd party, across the full life cycle

Substitutes/Alternates

Subject to compliance with all requirements, "or equal" must match the selected colors, have similar aesthetic appearance. Substitution sample and submittals must be submitted for written approval of quality and color at least ten days prior to bid to be considered.

2.04 PRODUCT ENVIRONMENTAL SPECIFICATIONS

Manufacturer will provide data establishing the fact that their products are *equal to or below the industry average* for carpet tiles in the following categories, as denoted by publicly available third party certified Environmental Product Declarations (Per 3rd party verified Environmental Product Declaration following ISO 14025 guidelines, EPD with Product Category Rules (PCR) for Building-Related Products and Services - Part A: Calculation rules for the LCA and Requirements Project Report.

- A. Embodied Carbon (global warming potential, GWP kg CO₂ equivalents)
- B. Ozone Layer Depletion (ozone depletion potential, ODP kg CFC-11 equivalents)
- C. Acid Rain (acidification potential of land and water, AP kg SO₂ equivalents)
- D. Water pollution from nitrogen and phosphorus fertilizers (eutrophication potential, EP kg N equivalents)
- E. Smog (smog formation potential, SFP kg O₃ equivalents)

Substitutes/Alternates

Subject to compliance with all requirements, "or equal" must have similar sustainability characteristics. Substitution sample and submittals must be submitted for written approval of quality and color at least ten days prior to bid to be considered.

2.05 ACCESSORIES

- A. Materials recommended by Manufacturer for patching, priming, etc.
- B. Transition strip free installation required. Carpet and hard surface of comparable total thickness should be installed adjacent to each other free of transition strips.

2.06 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

PART 3 EXECUTION

1.03 EXAMINATION / PREPARATION

- A. Prepare sub-floor to comply with criteria established in Manufacturer's installation instructions. Use only preparation materials that are acceptable to the Manufacturer.
 - 1. Remove all substances from sub-floor that would interfere with or be harmful to the installation.
 - 2. Remove sub-floor ridges and bumps. Fill cracks, joints, holes, and other defects.
- C. Verify that sub-floor is smooth and flat within specified tolerances and ready to receive carpet
- D. Verify that substrate surface is dust-free
- E. Verify that concrete surfaces are ready for installation by conducting moisture and pH testing. Results must be within limits recommended by Manufacturer.
- F. There will be no exceptions to the provisions stated in the Manufacturer's installation instructions.

3.02 INSTALLATION - GENERAL

- A. Install product in accordance with Manufacturer's installation instructions.
- B. Adhesive must meet the requirements of CRI's Green Label Plus program for adhesive. Provide documentation.

- C. Installation methodology will be VOC friendly for both installers & occupants of building
- D. Trim carpet neatly at walls and around interruptions.

3.03 PROTECTION & CLEANING

- A. Remove excess adhesive and/or seam sealer from floor and wall surfaces without damage.
- B. All rubbish, wrappings, debris, trimmings, etc. to be removed from site and recycled or disposed of properly.
- C. Clean and vacuum surfaces using a beater brush/bar commercial vacuum.
- D. After each area of is installed, protect from soiling and damage by other trades.

3.04 RECYCLING

1.1 Scope of Work

Owner requires that existing carpet being removed and carpet trim waste from new installation be recycled in the best possible manner. A reclamation plan will be submitted to owner for approval at start of work. Said plan will provide directions for the reclamation of recyclable carpet at the job site.

- A. First choice is repurposing, provided carpet is in usable condition
- B. Second choice is closed loop recycling turning carpet into carpet
- C. Third choice is waste to energy
- D. Last alternative is landfill

1.2 Description of Services Collection (Labor): Carpet must be removed from the existing installation and prepared for pickup based on the type of material and reclamation option selected. Specifications for removal from the job site are as follows:

A. Removal of carpet tile for recycling

1. Carpet tile must be palletized and secured for shipping; shrink wrapped, banded, strapped.
2. Pallets must be a minimum size of 40"x40" and material stacked approximately 54" high.
3. Pallets cannot be double stacked in the trailer.
4. Tile must be kept dry and free of any moisture damage.
5. Trailers must be free of any non-carpet debris, construction waste, cardboard boxes, trash.
6. Material must not contain mold or mildew.
7. Wet carpet will not be accepted.
8. Material must not contain vinyl asbestos or adhesives containing asbestos.

B. Removal of broadloom carpet for recycling

1. Less than full truckload quantities of broadloom (<3,000 yds) will need to be cut or rolled and secured to a pallet by shrink wrap or banding. Pallets must be a minimum size of 40"x40".
2. Full truckload quantities of broadloom (>3,000 yds) should be rolled and secured. The rolls should be neatly placed and stacked in the trailer.
3. Wet carpet will not be accepted.
4. Containers must be free of any non-carpet debris, construction waste, cardboard boxes, trash.
5. Material must not contain tac strips or metal staples.
6. Material must not contain mold or mildew.
7. Material must not contain vinyl asbestos or adhesives containing asbestos.

Material Loading: Shipper must load material on the carrier; drivers will not assist. Notification must be given prior to quote submittal of any special requirements such as liftgate, small trucks, etc. Additional fees will apply. Processing: All possible recycling options must be clearly presented and/or submitted on paper subsequent to job start. The accepted reclamation option must be approved in writing by the party requesting the services.

Certification: A certificate verifying the reclamation of the carpet and the pounds of material diverted from the landfill will be furnished upon request.

END OF SECTION

INTERIOR PAINTING

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 surface preparation and the application of paint systems on the following interior substrates:

1. Concrete.
2. Clay masonry.
3. Concrete masonry units (CMU).
4. Steel
5. Cast iron.
6. Galvanized metal.
7. Aluminum (not anodized or otherwise coated).
8. Wood.
9. Gypsum board.
10. Plaster.
11. Spray-textured ceilings.
12. Cotton or canvas insulation covering.
13. ASJ insulation covering.

- B. Related Requirements:

1. Section 051200 "Structural Steel Framing" for shop priming of metal substrates with primers specified in this section.
2. Section 099113 "Exterior Painting" for surface preparation and the application of paint systems on exterior substrates.
3. Section 099300 "Staining and Transparent Finishing" for surface preparation and the application of wood stains and transparent finishes on interior wood substrates.
4. Section 099600 "High-Performance Coatings" for tile-like coatings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Indicate VOC content.

- C. Samples for Initial Selection: For each type of topcoat product.

- D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Label each coat of each Sample.
 - 3. Label each Sample for location and application area.

- E. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. Indicate VOC content.

1.4 CLOSEOUT SUBMITTALS

- 1. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product/color/finish was used, product data pages, material safety data sheets, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 1 gal. (3.8 L) of each material and color applied.

1.6 QUALITY ASSURANCE

- 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.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer's label with the following information:
 1. Product name and type (description).
 2. Batch date.
 3. Color number.
 4. VOC content.
 5. Environmental handling requirements.
 6. Surface preparation requirements.
 7. Application instructions.
- B. 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 (7 deg C).
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
- C. Lead Paint: It is not expected that lead paint will be encountered in the Work.
 1. If suspected lead paint is encountered, do not disturb; immediately notify Architect and Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company (The); products indicated or comparable product from one of the following:
 1. PPG Paints.
 2. Benjamin Moore & Co.

3. Duron, Inc.

B. Comparable Products: Comparable products of approved manufacturers will be considered in accordance with Section 016000 "Product Requirements," and the following:

1. Products are approved by manufacturer in writing for application specified.
2. Products meet performance and physical characteristics of basis of design product including published ratio of solids by volume, plus or minus two percent.

C. Source Limitations: Obtain paint materials from single source from single listed manufacturer.

1. Manufacturer's designations listed on a separate color schedule are for color reference only and do not indicate prior approval.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

D. Colors: **As indicated on finish schedule on Drawing I110.**

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

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. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.
 - 1. Report, in writing, conditions that may affect application, appearance, or performance of paint.
- B. Substrate Conditions:
 - 1. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Concrete: 12 percent.
 - b. Masonry (Clay and CMU): 12 percent.
 - c. Wood: 15 percent.
 - d. Gypsum Board: 12 percent.
 - e. Plaster: 12 percent.
 - 2. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
 - 3. Plaster Substrates: Verify that plaster is fully cured.
 - 4. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected; application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates 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.
 - 1. 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.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
 - 1. Concrete Floors: Remove oil, dust, grease, dirt, and other foreign materials. Comply with SSPC-SP-13/NACE 6 or ICRI 03732.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 2, "Hand Tool Cleaning."
 - 2. SSPC-SP 3, "Power Tool Cleaning."
 - 3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."
 - 4. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- H. Aluminum Substrates: Remove loose surface oxidation.
- I. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- J. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. 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.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. 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.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. 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 panelboards and switch gear.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports. **(Discuss with Architect prior to painting)**
 - e. Metal conduit. (Discuss with Architect prior to painting)
 - f. Plastic conduit.
 - g. Tanks that do not have factory-applied final finishes.
 - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - i. Mechanical grills (to match adjacent color.)**
 2. Paint the following work where exposed in occupied spaces: **(Discuss with Architect prior to painting. However, the following to be included in Bid.)**
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.
2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. 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.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR MICROBICIDAL PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces:
 1. Microbicidal Latex Finish System: With topcoat EPA registered No. 64695-1.
 - a. Prime Coat: Primer sealer, latex, interior:
 - 1) S-W Loxon Concrete & Masonry Primer Sealer, A24W8300, at 8.0 mils (0.203 mm) wet, 3.2 mils (0.081 mm) dry.
 - b. First Coat: Microbicidal Latex, interior, matching topcoat.
 - c. Topcoat: Microbicidal Latex, interior, eggshell:
 - 1) S-W Paint Shield Interior Latex Eg-Shel Microbicidal Paint, D12W51, at 4.0 mils (0.102 mm) wet, 1.8 mils (0.046 mm) dry, per coat. Brush and roll application only.
- B. CMU Substrates:
 1. Microbicidal Latex Finish System: With topcoat EPA registered No. 64695-1.
 - a. Block Filler: One or two coats as required: Block filler, latex, interior/exterior:
 - 1) S-W Loxon Block Surfacer, A24W200, at 10.0 mils (0.254 mm) wet, 8.0 mils (0.203 mm) dry, per coat.
 - b. First Coat: Microbicidal Latex, interior, matching topcoat.
 - c. Topcoat: Microbicidal Latex, interior, eggshell:

- 1) S-W Paint Shield Interior Latex Eg-Shel Microbical Paint, D12W51, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat. Brush and roll application only.
- C. Wood Substrates: Including exposed wood items not indicated to receive shop-applied finish.
1. Microbical Latex Finish System: With topcoat EPA registered No. 64695-1.
 - a. Prime Coat: Primer, latex, interior, anti-microbial:
 - 1) S-W PrepRite ProBlock Interior/Exterior Latex Primer/Sealer, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry.
 - b. First Coat: Microbical Latex, interior, matching topcoat.
 - c. Topcoat: Microbical Latex, interior, eggshell:
 - 1) S-W Paint Shield Interior Latex Eg-Shel Microbical Paint, D12W51, at 4.0 mils (0.102 mm) wet, 1.8 mils (0.046 mm) dry, per coat. Brush and roll application only.
- D. **Gypsum Board** Substrates:
1. Microbical Latex Finish System: With topcoat EPA registered No. 64695-1.
 - a. Prime Coat: Primer, latex, interior:
 - 1) S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils (0.102 mm) wet, 1.0 mils (0.025 mm) dry.
 - b. First Coat: Microbical Latex, interior, matching topcoat.
 - c. Topcoat: Microbical Latex, interior, eggshell:
 - 1) S-W Paint Shield Interior Latex Eg-Shel Microbical Paint, D12W51, at 4.0 mils (0.102 mm) wet, 1.8 mils (0.046 mm) dry, per coat. Brush and roll application only.

3.7 INTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces:
1. Latex System:
 - a. Prime Coat: Primer, latex, interior.
 - 1) S-W Loxon Concrete & Masonry Primer Sealer, A24W8300, at 8.0 mils (0.203 mm) wet, 3.2 mils (0.081 mm) dry.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat.

- 1) S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.
 - d. Topcoat: Latex, interior, low sheen.
 - 1) S-W ProMar 200 Zero VOC Latex Low Sheen Eg-Shel, B24-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.
 - e. Topcoat: Latex, interior, eggshell.
 - 1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat .
 - f. Topcoat: Latex, interior, semi-gloss.
 - 1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat .
 - g. Topcoat: Latex, interior, gloss.
 - 1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.
2. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Primer sealer, latex, interior:
 - 1) S-W Loxon Concrete & Masonry Primer Sealer, A24W8300, at 8.0 mils (0.203 mm) wet, 3.2 mils (0.081 mm) dry.
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based, eggshell:
 - 1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K45-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss:
 - 1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
3. Two-Component Epoxy and Epoxy High Build Systems for Non-Traffic Surfaces: Refer to Section 099600 "High-Performance Coatings."
4. Concrete Stain System (Water-based) for Vertical Surfaces:
 - a. First Coat:
 - 1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).
 - b. Second Coat:

- 1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).

B. Concrete Substrates, Pedestrian Traffic Surfaces:

1. Latex Floor Enamel System:

- a. First Coat: Floor paint, latex, slip-resistant, matching topcoat.
- b. Topcoat: Floor paint, latex, slip-resistant, low gloss: S-W ArmorSeal Tread-Plex, B90 Series, at 1.5 to 2.0 mils (0.038 to 0.051 mm) dry per coat.

2. Clear Acrylic System, Gloss Finish:

a. First Coat:

- 1) S-W H&C Clarishield Water-Based Wet-Look Concrete Sealer, at 100 to 200 sq. ft. per gal. (2.45 to 4.91 sq. m per liter).

b. Second Coat:

- 1) S-W H&C Clarishield Water-Based Wet-Look Concrete Sealer, at 100 to 200 sq. ft. per gal. (2.45 to 4.91 sq. m per liter).

3. Concrete Stain System (Water-based):

a. First Coat: Low-luster opaque finish:

- 1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).

b. Second Coat: Low-luster opaque finish:

- 1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).

4. Epoxy and Urethane Coatings: Refer to Section 099600 "High-Performance Coatings."

5. Epoxy- and Urethane- Based Aggregate-Filled Floor Surfacing: Refer to Section 09 67 23 "Resinous Flooring."

C. CMU Substrates:

1. Latex System:

a. Block Filler: Block filler, latex, interior/exterior:

- 1) S-W PrepRite Block Filler, B25W25, at 75-125 sq. ft. per gal. (1.84 to 3.07 sq. m per liter).

b. Intermediate Coat: Latex, interior, matching topcoat.

c. Topcoat: Latex, interior, flat:

- 1) S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.
 - d. Topcoat: Latex, interior, low sheen:
 - 1) S-W ProMar 200 Zero VOC Latex Low Sheen Enamel, B24-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.
 - e. Topcoat: Latex, interior, eggshell:
 - 1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat.
 - f. Topcoat: Latex, interior, semi-gloss:
 - 1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.
 - g. Topcoat: Latex, interior, gloss:
 - 1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
2. Water-Based Light Industrial Coating System:
 - a. Block Filler: Block filler, latex, interior/exterior:
 - 1) S-W PrepRite Block Filler, B25W25, at 75-125 sq. ft. per gal. (1.84 to 3.07 sq. m per liter).
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based, eggshell:
 - 1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K45-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss:
 - 1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
3. Concrete Stain System (Water-based):
 - a. First Coat:
 - 1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).
 - b. Second Coat:
 - 1) S-W H&C Colortop Water-Based Solid Color Concrete Stain, at 50 to 300 sq. ft. per gal. (1.23 to 7.36 sq. m per liter).

4. Two-Component Epoxy and Epoxy High Build Systems for Non-Traffic Surfaces: Refer to Section 099600 "High-Performance Coatings."
5. Epoxy and Urethane Coatings: Refer to Section 099600 "High-Performance Coatings."

D. Metal Substrates (Aluminum, Steel, Galvanized Steel):

1. Latex System:

a. Prime Coat: Primer, rust-inhibitive, water based:

- 1) S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, at 5.0 to 10 mils (0.127 to 0.254 mm) wet, 2.0 to 4.0 mils (0.051 to 0.102 mm) dry.

b. Intermediate Coat: Water-based acrylic, interior, matching topcoat.

c. Topcoat: Water-based acrylic, semi-gloss:

- 1) S-W Pro Industrial Acrylic Semi-Gloss Coating, B66-650 Series, at 2.5 to 4.0 mils (0.064 to 0.102 mm) dry, per coat.

d. Topcoat: Water-based acrylic, gloss:

- 1) S-W Pro Industrial Acrylic Gloss Coating, B66-660 Series, at 2.5 to 4.0 mils (0.064 to 0.102 mm) dry, per coat.

2. Water-Based Dry-Fall System:

a. Top Coat: Dry-fall latex, flat:

- 1) S-W Pro Industrial Waterborne Acrylic Dryfall Flat, B42-181 Series, at 6.0 mils (0.152 mm) wet, 1.5 mils (0.038 mm) dry.

b. Top Coat: Dry-fall latex, eggshell:

- 1) S-W Pro Industrial Waterborne Acrylic DryFall Eg-Shel, B42-82, at 6.0 mils (0.152 mm) wet, 1.9 mils (0.048 mm) dry.

c. Top Coat: Dry-fall latex, semi-gloss:

- 1) S-W Pro Industrial Waterborne Acrylic DryFall Semi-Gloss, B42-83, at 5.8 mils (0.147 mm) wet, 2.3 mils (0.058 mm) dry.

3. Water-Based Light Industrial Coating System:

a. Prime Coat: Primer, rust-inhibitive, water based:

- 1) S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, at 5.0 to 10 mils (0.127 to 0.254 mm) wet, 2.0 to 4.0 mils (0.051 to 0.102 mm) dry.

b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.

c. Topcoat: Light industrial coating, interior, water based, eggshell:

- 1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K45-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss:
 - 1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
 4. Two-Component Epoxy and Epoxy High Build Systems: Refer to Section 099600 "High-Performance Coatings."
 5. Waterbased/Alkyd Urethane System:
 - a. Prime Coat:
 - 1) S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, at 5.0 to 10 mils (0.127 to 0.254 mm) wet, 2.0 to 4.0 mils (0.051 to 0.102 mm) dry.
 - b. Intermediate Coat: Water-based acrylic-alkyd, interior, matching topcoat.
 - c. Topcoat: Water-based alkyd-urethane, semi-gloss, interior:
 - 1) S-W Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.
 - d. Topcoat: Water-based alkyd-urethane, gloss, interior:
 - 1) S-W Pro Industrial Waterbased Alkyd Urethane Gloss, B53-1050 Series, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.
- E. Wood Substrates: Including exposed wood items not indicated to receive shop-applied finish.
 1. Latex System:
 - a. Prime Coat: Primer sealer, latex, interior:
 - 1) S-W PrepRite ProBlock Primer Sealer, B51-620 Series, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, eggshell:
 - 1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat.
 - d. Topcoat: Latex, interior, semi-gloss:
 - 1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.
 - e. Topcoat: Latex, interior, gloss:
 - 1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

2. Waterbased/Alkyd Urethane System:
 - a. Prime Coat: Primer sealer, latex, interior:
 - 1) S-W Premium Wall & Wood Primer, B28W8111, at 4.0 mils (0.102 mm) wet, 1.8 mils (0.046 mm) dry.
 - b. Intermediate Coat: Water-based alkyd-urethane, interior, matching topcoat.
 - c. Topcoat: Water-based alkyd-urethane, semi-gloss, interior:
 - 1) S-W Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.
 - d. Topcoat: Water-based alkyd-urethane, gloss, interior:
 - 1) S-W Pro Industrial Waterbased Alkyd Urethane Gloss, B53-1050 Series, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry, per coat.

3. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Primer sealer, latex, interior:
 - 1) S-W PrepRite ProBlock Primer Sealer, B51-620 Series, at 4.0 mils (0.102 mm) wet, 1.4 mils (0.036 mm) dry.
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based, eggshell:
 - 1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K45-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss:
 - 1) S-W Pro Industrial Pre-Catalyzed Water Based Epoxy, K46-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
4. Two-Component Epoxy and Epoxy High Build Systems: Refer to Section 099600 "High-Performance Coatings."

F. Wood Substrates, Pedestrian Traffic Surfaces:

1. Latex Floor Enamel System:
 - a. First Coat: Floor paint, latex, slip-resistant, matching topcoat.
 - b. Topcoat: Floor paint, latex, slip-resistant, low gloss:
 - 1) S-W ArmorSeal Tread-Plex, B90 Series, at 1.5 to 2.0 mils (0.038 to 0.051 mm) dry per coat.

G. **Gypsum Board** Substrates:

1. Latex System:
 - a. Prime Coat: Primer, latex, interior:
 - 1) S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils (0.102 mm) wet, 1.0 mils (0.025 mm) dry.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior, flat:
 - 1) S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.
 - d. Topcoat: Latex, interior, low sheen:
 - 1) S-W ProMar 200 Zero VOC Latex Low Sheen Enamel, B24-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.
 - e. Topcoat: Latex, interior, eggshell:
 - 1) S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils (0.102 mm) wet, 1.7 mils (0.043 mm) dry, per coat.
 - f. Topcoat: Latex, interior, semi-gloss:
 - 1) S-W ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series, at 4.0 mils (0.102 mm) wet, 1.6 mils (0.041 mm) dry, per coat.
 - g. Topcoat: Latex, interior, gloss:
 - 1) S-W ProMar 200 Zero VOC Gloss, B21-12650 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
2. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Primer sealer, latex, interior:
 - 1) S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils (0.102 mm) wet, 1.0 mils (0.025 mm) dry.
 - b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, interior, water based, eggshell:
 - 1) S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.
 - d. Topcoat: Light industrial coating, interior, water based, semi-gloss:
 - 1) S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46-151 Series, at 4.0 mils (0.102 mm) wet, 1.5 mils (0.038 mm) dry, per coat.

3. Two-Component Epoxy and Epoxy High Build Systems for Non-Traffic Surfaces:
Refer to Section 099600 "High-Performance Coatings."

END OF SECTION

STAINING AND TRANSPARENT FINISHING

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 surface preparation and application of wood stains and transparent finishes on the following substrates:

- 1. Exterior Substrates:

- a. Exposed framing.
 - b. Dressed lumber (finish carpentry or woodwork).

- 2. Interior Substrates:

- a. Exposed framing.
 - b. Dressed lumber (finish carpentry or woodwork).
 - c. Wood-based panel products.
 - d. Wood floors and stairs.

- B. Related Requirements:

- 1. Section 099123 "Interior Painting" for stains and transparent finishes on concrete floors.

1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- D. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- E. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 2. Indicate VOC content.
- C. Samples for Initial Selection: For each type of product.
- D. Samples for Verification: For each type of finish system and in each color and gloss of finish required.
1. Submit Samples on representative samples of actual wood substrates, 8 inches square or 8 inches long.
 2. Apply coats on Samples in steps to show each coat required for system.
 3. Label each coat of each Sample.
 4. Label each Sample for location and application area.
- E. Product List: Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Stains and Transparent Finishes: 5 percent, but not less than of each material and color applied.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each finish system indicated and each color selected to verify preliminary selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each type of finish system and substrate.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 2. Final approval of stain color selections will be based on mockups.
 - a. If preliminary stain color selections are not approved, apply additional mockups of additional stain colors selected by Architect at no added cost to Owner.

1.7 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.

1.8 FIELD CONDITIONS

- A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply finishes when relative humidity exceeds 85 percent, at temperatures less than 5 deg F above the dew point, or to damp or wet surfaces.
- C. Do not apply exterior finishes in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Benjamin Moore & Co.
 - 2. Dulux (formerly ICI Paints); a brand of AkzoNobel.
 - 3. Duron, Inc.
 - 4. PPG Architectural Coatings.
 - 5. Sherwin-Williams Company (The).
- B. Products: Subject to compliance with requirements, provide product listed in wood finish systems schedules for the product category indicated.

2.2 MATERIALS, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Stain Colors: As selected by Architect from manufacturer's full range.

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 Exterior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- C. Maximum Moisture Content of Interior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with finish application only after unsatisfactory conditions have been corrected.
 - 1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 - 1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each substrate condition and as specified.
 - 1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
 - 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.
- D. Exterior Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Prime edges, ends, faces, undersides, and backsides of wood.
 - a. For solid hide stained wood, stain edges and ends after priming.
 - b. For varnish-coated stained wood, stain edges and ends and prime with varnish. Prime undersides and backsides with varnish.
 - 3. Countersink steel nails, if used, and fill with putty or plastic wood filler tinted to final color. Sand smooth when dried.
- E. Interior Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.

2. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.
3. Sand surfaces exposed to view and dust off.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dry.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 1. Use applicators and techniques suited for finish and substrate indicated.
 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
 3. Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 INTERIOR WOOD -FINISH-SYSTEM SCHEDULE

- A. Wood substrates, nontraffic surfaces, including wood trim, architectural woodwork, doors, windows, and wood-based panel products.
 1. **Interior Water-Based over White Oak:**
 - a. Stain Coat: **natural sealer.**
 - b. First Intermediate Coat: **natural sealer matching topcoat.**
 - c. Second Intermediate Coat: **2000 Water based Polyurethane.**
 - d. Topcoat: **2000 Water based Polyurethane**

1) Sheen: **Satin.**

END OF SECTION

INTERIOR SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Panel signs.
 - 2. Room-identification signs.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- C. Shop Drawings:
 - 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 .
 - 4. Show locations of electrical service connections.
 - 5. Include diagrams for power, signal, and control wiring.
- D. Samples: For each exposed product and for each color and texture specified.
- E. Sign Schedule: Use same designations **indicated on Drawing I420 "Furniture, Equipment and Signage Floor Plan" in Signage Schedule.**

1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Executed warranty as indicated below.

1.5 WARRANTY

- A. The Signage Contractor, by commencing the work of the project, assumes overall responsibility, as a part of his warranty of the work, to assure that all assembled

components and parts shown or required within the work of this project comply with the contract documents. The Signage Contractor shall further warrant:

1. That all components specified, or required, to satisfactorily complete the installation, are compatible with each other and with the conditions of installation and expected use;
 2. The overall effective integration and correctness of individual parts and the whole of the system;
 3. Compatibility with adjoining substrate, materials and work by other trades;
 4. There shall be no premature material failure due to improper design or fabrication of the system. All materials shall fully perform to their normal life expectancy.
 5. Upon final completion, the Signage Contractor will warrant all work and materials to be in full and complete accordance with the contracts documents and agreement between Owner and Signage Contractor, and requirements appertaining thereto; that all work and materials are free from any and all defects and imperfections, and fully meet the manufacturer's published performance criteria for the use and purposes for which each and every part is specified.
 6. The Signage Contractor also agrees that, should any defect develop or appear, which the Graphic Designer and/or Owner finds was not caused by improper use, the Signage Contractor shall promptly, upon demand, fully correct, substitute and make good any such defective material without any cost to the Owner and will save the Owner harmless against any claim, demand, loss or damage by reason of any breach of this warranty.
 7. The period of this warranty shall commence on the date on which the the Signage Contractor has met all Final Completion requirements. The period of said warranty shall last twelve(12) months unless otherwise specified.
- B. All paints used must retain a minimum 10 year warranty for interior signage. This includes no cracking, flaking, and fading.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. **Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design sign structure and anchorage for all**

1. Ceiling Hung Signage

- B. 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/ANSI A117.1 for signs.

2.2 SIGNS

- A. Acceptable manufacturers: the following is a list of acceptable manufacturers:

1. Architectural Signing, Katie Beck (770)448-2026 ext. 1430

or Karen Schwartz (678)849-4988.

2. Henry Graphics, Shannon Henry (770) 932-3222 or (404) 403-2200

3. Option Signs Patti Huxford (770)569-5871

4. Parallax Digital Studios Inc., (770) 654-4006/ (770) 874-8500, x 153

5. Other manufacturers desiring approval comply with front-end document on alternate approval process prior to Bid.

B. Panel Sign, **as indicated on drawings**: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Solid-Sheet Sign Returns, and Back: Stainless-steel sheet with finish specified in "Surface Finish and Applied Graphics" Subparagraph below and as follows:

a. Etched, laser cut and/or Filled Graphics: Sign face etched, laser cut or routed. Infills to receive enamel-paint infill-**Black**.

2. Sign-Panel Perimeter: Finish edges smooth.

a. Edge Condition: Square cut.

b. Corner Condition in Elevation: Square.

3. Mounting:

a. Suspended with concealed anchors.

b. Surface mounted to wall with concealed anchors.

C. Room-Identification Sign, **as indicated on drawings**: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Laminated-Sheet Sign: Aluminum face sheet with raised graphics laminated over a plastic laminate sheet applied to an acrylic backing sheet to produce composite sheet.

a. Composite-Sheet Thickness: As indicated.

b. Surface-Applied Graphics: Applied vinyl film.

c. Cut-out graphics: To view laminate below, as indicated on **Drawings**.

d. Color(s): As indicated.

2. Sign-Panel Perimeter: Finish edges smooth.

a. Edge Condition: Square cut .

b. Corner Condition in Elevation: Square.

3. Mounting: Manufacturer's standard method for substrates indicated, Surface mounted to wall.

a. Glass mounted as indicated.

b. Gypsum Board surfaces.

- C. Overhead Room-Identification Sign, **as indicated on Drawings**: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. Fabricated Letters on base plate: Stainless steel fabricated letters as indicated per drawings.
 2. Sign-Panel Perimeter: Finish edges smooth.
 - a. Edge Condition: Square cut.
 - b. Corner Condition in Elevation: Square.
 3. Mounting: Manufacturer's standard method for substrates indicated, Mounted to top of suspended ceiling element.
- D. Adhesive backed Sheet Vinyl, **as indicated on Drawings**: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. Mounting: Adhesive backed applied to doors.
 - a. Center on door or directly above push bar.

2.3 PANEL-SIGN MATERIALS

- A. Stainless-Steel Sheet: Type 304, 2B Mill finish, dull.
- B. Aluminum sheet- Etched face design to match **Chemetal #914** Cross Hatch Aluminum(submit options for selection and approval).
- C. Acrylic Sheet: ASTM D 4802, Type UVF (UV filtering).
- D. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated and suitable for exterior applications.
- E. Woodwork Fabrication: Strictly comply with AWI standards and approved shop drawings. Provide work matching shapes, profiles and sizes indicated. Scribe work to fit with hair line accuracy. Miter and cope all wood joints and moldings. Securely fasten work to substrates, framing and blocking with concealed fasteners. When face fasteners are unavoidable, countersink fasteners and fill holes flush to be not noticeable after finishing. Conceal all seams in exterior panels with wood trim.

2.4 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. Use concealed fasteners and anchors unless indicated to be exposed.

2. Exposed Metal-Fastener Components, General:
 - a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
3. Sign Mounting Fasteners:
 - a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
 - b. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
 - c. Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, installed in predrilled holes.

B. Adhesive: As recommended by sign manufacturer.

C. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 1.14 mm thick, with adhesive on both sides.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.5 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
 1. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 2. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
 - a. All welding procedures shall conform to applicable AWS specifications.
 - b. All welds shall develop capacity of members being joined unless specified length or extent is noted on the drawings.
 - c. Type of alloy filler metal and electrodes to be that which is recommended by producer of the metal to be welded, and as required for color match, strength, and compatibility in the fabricated items.
 3. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 4. Internally brace signs for stability and for securing fasteners.
 5. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.
- B. Surface-Engraved Graphics: Machine engrave characters and other graphic devices into panel surface indicated to produce precisely formed copy, incised to uniform depth.

1. Engraved Metal: Fill engraved graphics with manufacturer's standard baked enamel.
 2. Engraved Opaque Acrylic Sheet: Fill engraved graphics with manufacturer's standard enamel.
 3. Face-Engraved Clear Acrylic Sheet: Fill engraved copy with manufacturer's standard enamel. Apply manufacturer's standard opaque background color coating to back face of acrylic sheet.
 4. Engraved Plastic Laminate: Engrave through exposed face ply of plastic-laminate sheet to expose contrasting core ply.
- C. Subsurface-Applied Graphics: Apply graphics to back face of clear face-sheet material to produce precisely formed image. Image shall be free of rough edges.
- D. Shop- and Subsurface-Applied Vinyl: Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fishmouths.
- E. Brackets: Fabricate brackets, fittings, and hardware for bracket-mounted signs to suit sign construction and mounting conditions indicated. Modify manufacturer's standard brackets as required.
1. Aluminum Brackets: Factory finish brackets with baked-enamel or powder-coat finish as specified color unless otherwise indicated.
 2. Stainless-Steel Brackets: Factory finish brackets with No. 4 finish unless otherwise indicated.

PART 3 - EXECUTION

3.1 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. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- B. Mounting Methods:
1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
 - a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface,

- embedding studs in holes. Temporarily support sign in position until adhesive fully sets.
- b. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.
2. Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
 - a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place spacers on studs, place sign in position, and push until spacers are pinched between sign and substrate, embedding the stud ends in holes. Temporarily support sign in position until adhesive fully sets.
 - b. Thin or Hollow Surfaces: Place spacers on studs, place sign in position with spacers pinched between sign and substrate, and install washers and nuts on stud ends projecting through opposite side of surface, and tighten.
 3. 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.
 4. Brackets: Remove loose debris from substrate surface and install backbar or bracket supports in position so that signage is correctly located and aligned.
 5. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.
 6. Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.
- C. Remove temporary protective coverings and strippable films as signs are installed.

END OF SECTION

WALL 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:
 - 1. Corner guards.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.
 - 2. Include fire ratings of units recessed in fire-rated walls.
- B. Sustainable Design Submittals:
 - 1. Product Data: For adhesives, indicating VOC content.
 - 2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.
- C. Shop Drawings: For each type of wall protection showing locations and extent.
 - 1. Include plans, elevations, sections, and attachment details.
- D. Samples for Initial Selection: For each type of impact-resistant wall-protection unit indicated, in each color and texture specified.
 - 1. Include Samples of accent strips and accessories to verify color selection.
 - 2. Corner Guards: 12 inches long. Include example top caps.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of handrail.
- B. Material Certificates: For each type of exposed plastic material.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of wall protection product to include in maintenance manuals.
 - 1. Include recommended methods and frequency of maintenance for maintaining best condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Corner-Guard Covers: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of cover installed, but no fewer than two, 48-inch- long units.
 - 2. Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store wall protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
 - 1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.
 - 2. Keep plastic materials out of direct sunlight.
 - 3. Store plastic wall-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.
 - a. Store corner-guard covers in a vertical position.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of wall-protection units that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
 - b. Deterioration of metals, metal finishes, plastics, and other materials beyond normal use.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain wall-protection products from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: 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.

2.3 CORNER GUARDS

- A. Surface-Mounted, Metal Corner Guards: Fabricated as one piece from formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.
 - 1. Basis-of-Design: Subject to compliance with requirements, provide Koroguard Metal Corner Guards by Koroseal, or a comparable product as approved by the Architect.
 - 2. Material: Stainless-steel sheet, Type 304.
 - a. Thickness: 16 gauge.
 - b. Finish: Directional satin, No. 4.
 - 3. Wing Size: As selected by the Architect from the manufacturer's full range.
 - 4. Corner Radius: As selected by the Architect from the manufacturer's full range.
 - 5. Mounting: As selected by the Architect.
 - 6. Height: Eight feet, unless otherwise indicated.

2.4 MATERIALS

- A. Stainless Steel: Type 304; 16 gauge.
- B. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.
- C. Adhesive: As recommended by protection product manufacturer.
 - 1. Adhesives shall have a VOC content of 70 g/L or less.
 - 2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.5 FABRICATION

- A. Fabricate wall protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.

- B. Factory Assembly: Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
- C. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.6 FINISHES

- A. Protect 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 and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine walls to which wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
 - 1. For wall protection attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Complete finishing operations, including painting, before installing wall protection.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

- A. Installation Quality: Install wall protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
- B. Mounting Heights: Install wall protection in locations and at mounting heights indicated on Drawings.
- C. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.
 - 1. Provide anchoring devices and suitable locations to withstand imposed loads.
 - 2. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches apart.

3. Adjust caps as required to ensure tight seams.

3.4 CLEANING

- A. Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION

TOILET AND CUSTODIAL ACCESSORIES

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. Public-use washroom accessories.
 - 2. Custodial accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
 - 1. Construction details and dimensions.
 - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Material and finish descriptions.
 - 4. Features that will be included for Project.
 - 5. Manufacturer's warranty.
- C. Samples: Full size, for each accessory item to verify design, operation, and finish requirements.
 - 1. Approved full-size Samples will be returned and may be used in the Work.
- D. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated.
 - 2. Identify products using designations indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

1.7 COORDINATION

- A. 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.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- B. 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.
- C. Install blocking (wood or metal strap) required to support toilet accessories at all accessories.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. American Specialties, Inc.
 - 2. Bobrick Washroom Equipment, Inc.
 - 3. Bradley Corporation.
 - 4. Approved equal prior to bid.

***NOTE: ALL ACCESSORIES TO BE VERIFIED WITH OWNER PRIOR TO PURCHASING AND INSTALLATION.**

- B. **Baby Changer**
 - 1. **Basis-of-Design Product: Bobrick KOALA KARE KB110-SSRE**
 - 2. **Material and Finish: Horizontal, recessed mounted baby changing station, stainless steel finish**
- C. **Grab Bars: GB**

1. **Basis-of-Design Product: Two-wall horizontal grab bar, 1 1/4" diameter; Bobrick #B-5897.**
2. **Material and Finish: Stainless steel with peened gripping, No. 4 finish (satin brushed).**

D. Mirror: M

1. **Product: as indicated on Drawing A230.**
2. **Material and Finish: No. 1 quality, 1/4" float/plate glass selected for silvering electrolytically cooper-plated by the galvanic process, guaranteed against spoilage. All edges protected by friction-absorbing filler strips; back is protected by full size shock absorbing, water-resistant, non-abrasive 1/8" thick polyethylene padding. Caulk joints between bottoms of mirrors and tops of backsplashes and side splashes at vanities with clear, mildew-resistant silicone sealant.**

E. Mop Holder: MH

1. **Basis-of-Design Product: Bobrick B-223 x 24**
2. **Material and Finish: satin-finish stainless steel.**

F. Paper Towel Dispenser: PT

1. **Basis-of-Design Product: Bobrick B-29744, Semi-recessed**
2. **Material and Finish: Stainless steel, No. 4 finish (satin brushed), Semi-recessed**

G. Robe Hook: RH

1. **Basis-of-Design Product: Bobrick B-76717**
2. **Material and Finish: satin brushed stainless steel.**

H. Waste Receptacle: T2

1. **Basis-of-Design Product: Bobrick #B-377-38**
 - a. **Confirm size of Trash Dispenser will fit under counter prior to ordering.**
2. **Material and Finish: Stainless steel, No. 4 finish (satin brushed).**

2.4 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION

FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes fire-protection cabinets for portable fire extinguishers.
- B. Fire extinguishers shall be of the types and sizes required by NFPA 10 and the local authority having jurisdiction. The fire extinguishers must be UL listed with a UL listing mark for type, rating and classification of each extinguisher.**

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For fire-protection cabinets.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.4 COORDINATION

- 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.

1.5 SEQUENCING

- A. Apply vinyl pictorial label on fire-protection cabinets after painting is complete.

1.6 WARRANTY

- A. Extinguishers shall have manufacturer's standard form warranty in which manufacturer agrees to repair or replace fire extinguishers that fail in materials and workmanship within a specified warranty period of six years. Failures include, but are not limited to, the following: failure of hydrostatic tests according to NFPA 10 and faulty operation of valves or release levers.**

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. 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. **Cabinets and placement of cabinets shall conform to requirements of the Americans with Disabilities Act as to maximum projection into corridors and height from finished floor.**

2.2 FIRE-PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. **JL Industries, Inc.; a division of the Activar Construction Products Group.**
 - b. Approved equal prior to bid.
- B. Cabinet with Stainless Steel Trim and Door: **Cosmopolitan Series, Model**
 - 1. Cabinet Style: **Semi-Recessed or Surface Mounted as indicated on life safety plans. Steel Powder-coated finish, color to match adjacent wall. Solid door with pull. Refer to drawing G200 for specific instructions. Basis of Design: JL Industries Ambassador Series 1016S21.**
 - 2. Components:
 - a. Tub: Cold-rolled steel.
 - 1) Finish: Factory-applied **powder coat paint finish**. Field painting is NOT acceptable.
 - a) Standard Color: **Match adjacent wall**
 - b. Door and Trim Construction: **Powder coated steel**; flush doors with **5/8"** door stop attached by continuous hinge and equipped with zinc-plated handle with roller catch.
 - 1) Finish: Factory-applied powder coat paint finish.
 - a) Standard Color: **Match adjacent wall**
 - b) **Apply a silver metallic fire extinguisher pictorial label to the outside of door in location and size as indicated on drawing 2/G200.**
 - c. Trim Style and Depth:
 - 1) Recessed Cabinet: **5/8"** flat trim.

2.3 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.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Prepare recesses for semi-recessed fire-protection cabinets as required by type and size of cabinet and trim style.
- B. Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
- C. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
- D. Identification: Apply vinyl lettering at locations indicated.
- E. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

END OF SECTION

FIRE EXTINGUISHERS

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 portable, fire extinguishers and mounting brackets for fire extinguishers in locations indicated on floor plans.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 - 1. Provide fire extinguishers approved, listed, and labeled by FMG.

1.7 COORDINATION

- A. Coordinate type, capacity, labeling and location of fire extinguishers with the local Fire Marshall to ensure fit and function.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers 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: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each mounting bracket indicated.
1. Manufacturers: Subject to compliance with requirements, provide products, approved by the authority having jurisdiction, by one of the following:
 - a. J. L. Industries, Inc.; a division of Activar Construction Products Group.
 - b. Larsen's Manufacturing Company.
 - c. Approved equal prior to bid.
 2. Valves: Nickel-plated, polished brass body.
 3. Handles and Levers: Stainless steel.
 4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.

FEC-1 (non-water –typical applications): Provide UL rated 2A, 10BC extinguisher. Field verify locations (coordinate with local Fire Officials).

Extinguisher NO. LARSEN MP10, 10# WITH 4A; 60 B:C DRY CHEMICAL EXTINGUISHER. NO HALON PRODUCTS PERMITTED.

2.2 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers specified, or required by authority having jurisdiction, with plated finish.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. J. L. Industries, Inc.; a division of Activar Construction Products Group.
 - b. Larsen's Manufacturing Company.
 - c. Approved equal prior to bid.

- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect.
 - 1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
 - a. Orientation: Vertical.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations compliant with requirements of authorities having jurisdiction.
 - 1. Mounting Brackets: 54 inches above finished floor to top of fire extinguisher.
- B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.
- C. Sealant: Sealant at perimeter, typical surround sealant color to match adjacent wall.
- D. Cabinets: Provide semi-recessed cabinets

END OF SECTION

SOLAR SHADES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Solar Shades

1.2 SUBMITTALS

- A. Product data: Manufacturer's complete CSI 3- part specification sheet.
- B. Samples:
 - 1. Submit working hand sample or mock up shade as required.
 - 2. Submit two 6" samples of shade fabric.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Product to be delivered in manufacturer's original packaging.
- B. Products to be handled and stored to prevent damage to materials, finishes and operating mechanisms. Store in a clean, dry area, laid flat to prevent sagging and twisting of packaging.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. **Mecho Systems, Inc.** or architect approved equivalent.
- B. Substitutions Request: Submit for approval under provisions of section 01600.

2.2 CELLULAR SHADES

- A. Product: Mecho Systems, Inc. Mecho/5 manual shade system
- B. **Solar Shade Fabric: Select from NFPA 701-1999 FR and ASTM-G21 and G22 Bacteria and Fungal Resistance approved:**
 - 1. Shades**
 - a. **Fabric Style: Refer to finish legend.**
 - b. **Color Name: Refer finish legend.**
 - c. **Location: Refer to architectural finish plan.**
- C. Roller Tubes: Shall be an extruded aluminum tube with a wall thickness of .050", incorporating two internal locking channels running the length of the tube for added strength and durability. Shade material will be attached to the tube by placing fabric end into internal locking channel and inserting a vinyl strip the length of the tube, locking fabric into place.
- D. Clutch Systems: Shall be a wrap spring design with high strength acetal and glass filled nylon components. Spring shall be stainless steel and will raise and lower the shade by means of a continuous #10 stainless steel bead chain.

- E. Clutch Operation will be by means of a continuous #10 Stainless Steel bean chain providing a positive lifting and lowering of the shade.
- F. Idle End is made of nylon with a spring loaded center pin for smooth and quiet operation.
- G. Roll Orientation: Standard will be fabric coming from backside of tube closest to the window.
Optional:
Reverse roll will have fabric coming over the roller tube (not available with fascia),
- H. Bottom Hem Bar will be extruded aluminum measuring 1.2" high by .58" deep with a .050" wall thickness. The room facing side of the hem bar will be fabric wrapped with the fabric secured by a vinyl locking strip insert at the top and bottom of the bar. The backside of the bar will be either white, anodized silver or bronze with color coordinated injection molded thermoplastic end plugs.
- I. Installation brackets without fascia shall be .060" thick and available in white or black and shall facilitate side, rear and top mounting applications. For shades with fascia option, brackets shall measure .065" thick and color coordinated to match fascia.
- J. Options:
 - 1. Fascia will be extruded aluminum measuring .075" thick, snap in locking system and will enclose the roller tube and mounting brackets.
 - a. Color: Anodized Silver
 - 2. Side Channels will be extruded aluminum measuring 1.25" by 2.06" with a wall thickness of .060". Side channels will include a mole hair weather stripping insert.
 - a. Color: Anodized Silver
 - 3. Sill Channels will be extruded aluminum measuring 1.25" by 2.06" with a wall thickness of .060". Sill channels will include a mole hair weather stripping insert
 - a. Color: Anodized Silver

2.3.1 FABRICATION

- A. Shades shall be fabricated according to specifications and accurate to tolerance established by SWF engineering standards

PART 3 EXECUTION

3.01 INSPECTION

- A. Installer shall be responsible for inspection of jobsite, approval of mounting surfaces, verification of field measurements and installation conditions. Installation shall commence when satisfactory conditions are met.

3.02 INSTALLATION

- A. Install shades in accordance with manufacturer's instructions including recommended support brackets and fasteners.
- B. Install shades with adequate clearance to permit smooth operation of the blinds. Demonstrate blinds to be in smooth, uniform working order.

3.03 MAINTENANCE AND CLEANING

- A. Maintain and clean shades in accordance with manufacturer's instructions.

END OF SECTION