

**STATE OF NEW HAMPSHIRE  
DEPARTMENT OF NATURAL AND CULTURAL RESOURCES  
DIVISION OF PARKS AND RECREATION  
PLANNING AND DEVELOPMENT**

172 Pembroke Road  
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Concord, NH 03302-1856  
Tel. (603) 271-2606 Fax (603) 271-2629

PROJECT MANUAL

Project No.: CAP 2018

Ellacoya State Park

# RV Park Bathhouse Renovation

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Gilford, New Hampshire

4/12/2021

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**SECTION 00 11 16**

**INVITATION TO BID**

RV Park BATHHOUSE RENOVATION  
CAP 2018  
LACONIA, NEW HAMPSHIRE

1. **Sealed Bids:** Proposals for a General Contract for the Construction of the above project will be received by the Owner until 2:00 P.M. prevailing time on Tuesday, May 18, 2021, at which time they will be publicly opened and read aloud. All Bids shall be made out only on the form included in the specifications package and delivered in sealed, labeled envelope marked: Bid Proposal for Ellacoya RV Park Bathhouse Renovation and deposited in the bid box located at the reception desk of the Department of Natural and Cultural Resources (DNCR) offices at 172 Pembroke Road in Concord, NH. Bidders are invited to attend the Bid opening. Bids received after the above stated time and date will not be accepted.
2. **Technical Questions:** Questions regarding the Bidding Documents shall be referred to: Department of Natural and Cultural Resources, 172 Pembroke Road, Concord New Hampshire, 03301, Telephone (603) 271-2606, attention Tom Mansfield, Department Architect.
3. **Documents:** Bidding Documents may be examined at the Planning and Development Section of DNCR, 172 Pembroke Road, Concord NH and at the following locations:  
  
**Construction Summary of New Hampshire Inc.:** 734 Chestnut Street, Manchester, New Hampshire 03104, (603) 627-8856, [www.constructionsummary.com](http://www.constructionsummary.com)  
  
**Infinite Imaging:** 933 Islington Street, Portsmouth, NH 03801, (800) 581-2712 or (603) 436-3030, [www.planroom.infiniteimaging.com](http://www.planroom.infiniteimaging.com)  
  
**McGraw-Hill Construction:** [www.construction.com](http://www.construction.com)  
  
**Signature Digital Imaging:** 45 Londonderry Turnpike, Hooksett, NH 03106, (603) 624-4025, [www.signaturenh.com](http://www.signaturenh.com)  
  
**Works in Progress:** 20 Farrell Street, Suite 103, South Burlington, VT 05403. (800) 286 3633 or (802) 658-3797  
  
**New Hampshire Department of Administrative Services Bureau of Purchase and Property Website:** <http://admin.state.nh.us/purchasing/vendorresources.asp>  
  
**New Hampshire State Parks Website:** [www.nhstateparks.org](http://www.nhstateparks.org) under the News & Events tab improvement projects sub tab
4. **Qualifications:** All companies, corporations, and trade names bidding must be registered and have a Certificate of Existence from the New Hampshire Secretary of State's Office, Corporate Division (telephone 603-271-3244) in order to do business with the State of New Hampshire



New Hampshire Department of Natural and Cultural Resources  
**RV Park Bathhouse Renovation**

5. Bid Security: A Bid Bond in the amount of five (5%) percent of the total amount of the lump sum bid price shall accompany each Bid Proposal in accordance with the Instructions to Bidders.
6. Bonds: Bidders shall be required to provide the Owner with security for the completion of the contract in accordance with the plans, specifications and contract documents, in the form of a Performance and Payment Bond in the amount of One Hundred (100%) Percent of the contract award, if the contract award is thirty-five thousand dollars (\$35,000) or more, the cost of which shall be a part of the Base Bid. The form of bond and the surety shall be acceptable to the Commissioner. No contract bond shall be required on contract awards of less than thirty-five thousand dollars (\$35,000).
7. Inspection of Site: A pre-bid tour of the existing building/site will be conducted by the Owner and Architect on May 5, 2021 at 10:00 a.m. Attendance by Bidders shall be considered mandatory.
8. Awards: In most cases the proposal submitted by the qualified bidder with the lowest base bid price shall be selected. However, the Department of Natural and Cultural Resources (DNCR) reserves the right to reject any or all proposals, or advertise for new proposals as it judges to be in the best interest of the state.
9. Regulations: Bidders' attention is called to the fact that this Project is required to comply with, in addition to all other requirements of the Contract Documents, Equal Employment Opportunity and Affirmative Action Regulations.

**END OF INVITATION TO BID**

**SECTION 00 21 13**

**INSTRUCTIONS TO BIDDERS**

**DEFINITIONS**

1. Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.
2. Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements include the Invitation to Bid, Instructions to Bidders, the Proposal Form and other sample Bidding and Contract forms.
3. Addenda are written or graphic instruments issued prior to the execution of the Contract. They modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.
4. A Bid is a complete and properly signed Proposal to do the Work or designated portion thereof for the sums stipulated therein, submitted in accordance with the Bidding Documents.
5. The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or deducted for sums stated in Alternate Bids.
6. An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in Work, as described in the Bidding Documents, is accepted.
7. A Unit Price is an amount stated in the Bid as a possible price per unit of measurement for materials, equipment, services or a portion of the Work as described in Bidding Documents. The choice of using Unit Prices, or an alternative method of payment, for additional Work shall be left solely to the Owner's discretion.
8. A Bidder is a person or entity who submits a Bid.
9. A Sub-Bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

**BIDDER'S REPRESENTATION**

1. Each Bidder by making his Bid represents that he has examined and understands the Bidding Documents, that the Bidding Documents are adequate to produce the required results, and that his Bid is in accordance therewith.

2. Each Bidder by making his Bid represents that he has visited and thoroughly inspected the existing building and site and familiarized himself with the local conditions under which the Work will be performed. Bidders are encouraged to make any and all inspections and tests as they feel necessary to achieve such familiarization prior to submitting Bids. Such inspections and tests shall be conducted at times mutually acceptable to the Owner and Bidder. Unless waived by the Owner, Bidders shall make repairs following their testing, as necessary to restore tested areas to pre-testing condition. Should a Bidder conclude that time or other factor(s) prohibits him from performing sufficient tests, he shall so notify the Owner, in writing, prior to the receipt of Bids.
3. The submission of a Bid will be construed as conclusive evidence that the Bidder has made all such examinations and inspections necessary for a complete and proper assessment of the Work required, and that the Bidder has included in his Bid a sum sufficient to cover the cost of all items necessary to perform the Work as set forth in the proposed Contract Documents. No allowance will be made to a Bidder because of lack of such examination, inspection or knowledge.
4. Each Bidder by making his Bid represents that he has assessed the conditions of the current construction marketplace, and verified that an adequate, experienced workforce is available to suitably man the Work of this Project, and complete it in a timely fashion.
5. Each Bidder is assumed to have made himself familiar with all Federal, State and Local laws, ordinances and regulations which in any manner affect those engaged in or upon the Work, or in any way affect those engaged or employed in the Work, and no plea of misunderstanding will be considered on account of ignorance thereof. The Contractor shall comply with all taxes, fees and assessments as levied by Federal, State and Local authorities.

## **BIDDING PROCEDURES**

1. All Bids must be prepared on the Proposal forms provided in the Specification and submitted in duplicate copies in accordance with the Notice to Bidders and Instructions to Bidders.
2. A Bid shall be invalid if it has not been deposited at the designated location prior to the time and date in the Invitation to Bid, or prior to any extension thereof issued to the Bidders.
3. Each copy of a Bid shall be signed by the person or persons legally authorized to bind the Bidder to a Contract.
4. Unless otherwise provided in any supplement to these Instructions to Bidders, no Bidder shall modify, withdraw or cancel his Bid or any part thereof for Ninety (90) days after the time designated for the receipt of Bids in the Notice to Bidders.
5. Prior to the receipt of Bids, Addenda will be e-mailed, mailed or delivered to each person or firm recorded by the Owner as having attended pre-bid conferences and will be available for inspection wherever the Bidding Documents are kept available for that purpose.

## **BID SECURITY**

1. Bid Security shall be made payable to the Owner, in the amount of not less than five percent (5%) of the Bid Sum and shall be attached to the Bid. Security shall be either a certified check or Bid Bond issued by surety licensed to conduct business in the State of New Hampshire. The successful Bidder's security will be retained until he has signed the Agreement or Contract and furnished the required Performance and Payment Bonds and Certificates of Insurance. The Owner reserves the right to retain the Security of the next two lowest Bidders until the low Bidder enters into a Contract, or until Ninety (90) days after Bid opening, whichever occurs first. Bid Security of all other Bidders will be returned as soon as practicable. If any Bidder refuses to enter into an Agreement or Contract, the Owner will retain his Bid Security as liquidated damages, but not as a penalty.

#### **EXAMINATION OF BIDDING DOCUMENTS**

1. Each Bidder shall examine the Bidding Documents carefully and, not later than seven (7) days prior to the date of receipt of Bids, shall make written request to the Owner for interpretation or correction of any ambiguity, inconsistency or error therein, which he may discover. Any interpretation or correction will be issued as an Addendum by the Owner. Only a written interpretation or correction by Addendum will be binding. No Bidder shall rely upon any interpretation or correction given by any other method. Bidders are encouraged to direct any questions which may arise to the Owner, in order to provide necessary clarifications prior to the receipt of Bids. Bidders shall promptly notify the Owner of any ambiguity, inconsistency or error which they may discover upon examination of the Bidding Documents, or the existing building, site or local conditions. Should a Bidder fail to notify the Owner of errors, discrepancies or contradictions, he shall be assumed to have bid the more expensive alternative.

#### **SUBSTITUTIONS**

1. Each Bidder represents that his Bid is based upon the materials and equipment described in the Bidding Documents. Where the language "or approved equal" is used in the Bidding Documents, it is intended to require that all such materials and equipment shall be submitted as required by these Instructions to Bidders, and approved by the Owner prior to the receipt of Bids.
2. No substitution will be considered unless written request has been submitted to the Owner for approval at least seven (7) days prior to the date for receipt of Bids. Each such request shall include a complete description of the proposed substitute, the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and test data and any other data or information necessary for a complete evaluation. A statement identifying changes in other materials, equipment or other portions of the Work that incorporation of the proposed substitution would require shall also be included.
3. If a Bidder proposes to use a material which, while suitable for the intended use, deviates in any way from the detailed requirements of the Contract Documents, he shall inform the Owner in writing of the nature of such deviations at the time the material is submitted for approval. It shall be the responsibility of the Bidder to notify the Owner, in writing, of the presence of Asbestos or any other hazardous materials in any proposed substitution. Such written notice shall be in the form of a cover letter attached to the related documents.

4. In requesting approval of deviations or substitutions, a Bidder shall provide, upon request, evidence leading to a reasonable certainty that the proposed substitution or deviation will provide a quality of result at least equal to that otherwise attainable. If, in the opinion of the Owner, the evidence presented by the Bidder does not provide a sufficient basis for such reasonable certainty, the Owner may reject such substitution or deviation without further investigation.
5. In requesting approval of substitutions, a Bidder represents that he will provide the same warranty and/or guarantee for the substitution that he would for that specified.
6. The Contract Documents are intended to produce a building and site improvements of consistent character and quality of design. The Owner shall judge the design and appearance of proposed substitutes on the basis of their suitability in relationship to the overall design of the project, as well as for their intrinsic merits. The Owner will not approve as equal to materials specified proposed substitutions which, in his opinion, would be out of character, obtrusive, or otherwise inconsistent with the character or quality of design of the project.
7. The Contractor shall be solely responsible for coordinating the installation of accepted substitutions, making such changes as may be required for the Work to be complete in all respects. Any additional cost, or any loss or damage arising from the substitution of any material or any method for those originally specified shall be borne by the Contractor, notwithstanding approval or acceptance of such substitution by the Owner, unless such substitution was made at the written request or direction of the Owner.
8. The burden of proof of the merit of a proposed substitution is upon the proposer. Approval of a proposed substitution is valid only upon issuance by the Owner in written form, and the Owner's decision of approval or disapproval of a proposed substitution shall be considered final.

**END OF INSTRUCTIONS TO BIDDERS**

**SECTION 00 41 00**

**BID PROPOSAL FORM**

**Project No.**                    **CAP #2018**

**PROJECT:**                    **RV Park Bathhouse Renovation**  
Ellacoya State Park  
280 Scenic Road  
Gilford, NH 03249-7610

**DATE BID OPENING:**   **May 18, 2021** at 2:00 pm at DNCR's office at 172 Pembroke Road, Concord, NH

**START DATE:**                **October 18, 2021**

**COMPLETION DATE:**   **April 15, 2022**

Sealed bid proposals for the above project will be accepted until **2:00 p.m., May 18, 2021**. Bids may be deposited in the bid box at DNCR's offices in Concord or mailed to the attention of Scott Coruth, Architect, Department of Natural and Cultural Resources (DNCR), 172 Pembroke Road, Concord NH 03301. Please note on the outside of the sealed envelope: Bid Proposal for Ellacoya RV Park Bathhouse Renovation.

**DATE:** \_\_\_\_\_

**PROPOSAL OF:** \_\_\_\_\_

**GRAND TOTAL / LUMP SUM BASE BID (A+B):** \_\_\_\_\_

# PROPOSAL

## Proposal of...

(name)

(address)

To furnish and deliver all materials except as noted and to perform all work in accordance with the Contract of the State of New Hampshire, Department of Natural and Cultural Resources for the construction of...

Project: **CAP #2018 RV Park Bathhouse Renovation**  
Ellacoya State Park  
280 Scenic Road  
Gilford, NH 03249-7610

Commissioner  
Department of Natural and Cultural Resources  
172 Pembroke Road, P.O. Box 1856  
Concord, N.H. 03302-1856

Commissioner:

In accordance with the advertisement of the Department of Natural and Cultural Resources inviting proposals for the project herein before named and in conformity with the Plans and Specifications on file in the office of the Department of Natural and Cultural Resources,

(firm name) hereby certifies that \_\_\_\_\_ is/are the only person, or persons, interested in this proposal as principals; that this proposal is made without collusion with any person, firm, or corporation; that an examination has been made of the Plans, of the Standard Specifications, and Special Attentions, Supplemental Specifications, and Special Provisions, all of which are attached hereto, and also of the site of the work; and I, or we, propose to furnish all necessary machinery, equipment, tools, labor, and other means of construction, and to furnish all materials specified in the manner and at the time prescribed; and understand that the quantities of work as shown herein are approximate only and are subject to increase or decrease, and further understand that all quantities of work are to be performed at the quoted prices.

To execute the form of contract and begin work within 15 (fifteen) days after the notice to proceed has been received or otherwise delivered to the contractor and to prosecute said work until its completion.

**It is further proposed:**

To furnish a contract bond in the amount of one hundred percent (100%) of the contract award, if the contract award is thirty-five thousand dollars (\$35,000) or more, as security for the completion of the contract in accordance with the plans and specifications and contract documents. The form of bond shall be that provided for by the Department, and the surety shall be acceptable to the Commissioner. No contract bond shall be required on contract awards of less than thirty-five thousand dollars (\$35,000).

To guarantee all of the work performed under this contract to be done in accordance with the plans and

New Hampshire Department of Natural and Cultural Resources  
**RV Park Bathhouse Renovation**

specifications and contract documents.

Enclosed, herewith, find certified check or bid bond in the amount of 5% of the total amount of the Lump Sum Price made payable to the "Treasurer, State of New Hampshire" as a proposal guarantee which is understood, will be forfeited in the event the form of contract is not executed, if awarded to the undersigned. Note: Personal checks will not be accepted as a proposal guarantee.

The undersigned acknowledges receipt of the following addenda, issued during the bidding time, and states that these have been incorporated in the proposal:

Addendum #1 dated \_\_\_\_\_

Addendum #2 dated \_\_\_\_\_

Addendum #3 dated \_\_\_\_\_

Dated \_\_\_\_\_

**ALLOWANCE #1: Unanticipated Modification and/or Additions to Contract Items:**

Include in the Contract, a stipulated sum/price of \$35,000 for use upon the Project Managers instruction. This Allowance will make money available for modifications and/or additions to contract items due to owner-initiated changes, or for unknown, latent or differing existing conditions, or for the removal of hazardous materials that are encountered by construction.

- a. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Allowance. The cost of the bond for the amount of Allowance shall be included as part of the lump sum base bid.
- b. Funds will be drawn from an Allowance only by Change Order. Contractor can proceed with Change Order Work against Allowance with direction from the Project Manager. The Contractor shall not proceed with any work that will exceed the amount of Allowance remaining.
- c. Credits can only be added to an Allowance by Alteration Order. The Contractor may not use a credit until an Alteration Order is fully executed.
- d. Notwithstanding the Contractors objection, the Project Manager may at any time reduce the funds remaining in the Allowance by Alteration Order.
- e. At Final Payment of the Contract, funds remaining in the Allowance will be credited to the State.



New Hampshire Department of Natural and Cultural Resources  
**RV Park Bathhouse Renovation**

**SCHEDULE OF VALUES: Ellacoya RV Park Bathhouse Renovation**

INDICATE DOLLAR AMOUNT OF CONTRACT SUM ALLOCATED TO EACH CATEGORY OF WORK AS DESIGNATED BELOW:

Specification Sections	Description	Amount
	<b>General Conditions</b>	
	<b>Bond Cost</b>	
	<b>Insurance</b>	
<b>02 41 19</b>	<b>Demolition</b>	
<b>05 52 13</b>	<b>Pipe and Tube Railings</b>	
<b>06 10 00</b>	<b>Rough Carpentry</b>	
<b>06 20 00</b>	<b>Finish Carpentry</b>	
<b>06 40 00</b>	<b>Architectural Wood Casework</b>	
<b>06 61 16</b>	<b>Solid Surfacing Fabrications</b>	
<b>06 64 00</b>	<b>Plastic Paneling</b>	
<b>07 25 00</b>	<b>Weather Barriers</b>	
<b>07 31 13</b>	<b>Asphalt Shingles</b>	
<b>07 46 23</b>	<b>Wood Siding</b>	
<b>07 62 00</b>	<b>Sheet Metal Flashing and Trim</b>	
<b>07 92 00</b>	<b>Joint Sealants</b>	
<b>08 16 00</b>	<b>Composite Doors</b>	
<b>08 71 00</b>	<b>Door Hardware</b>	
<b>09 29 00</b>	<b>Gypsum Board</b>	
<b>09 30 00</b>	<b>Tiling</b>	
<b>09 67 23</b>	<b>Resinous Flooring</b>	
<b>09 91 00</b>	<b>Painting, Staining and Transparent Finishing</b>	
<b>09 93 00</b>		
<b>10 14 00</b>	<b>Signage</b>	
<b>10 28 00</b>	<b>Toilet, Bath and Laundry Accessories</b>	
<b>22 00 00</b>	<b>Plumbing</b>	
<b>23 00 00</b>	<b>Heating, Ventilating and Air Conditioning</b>	
<b>26 00 00</b>	<b>Electrical</b>	

**Sub Total (A):**

**Allowance #1 (B):** \$35,000

**Grand Total: lump sum base bid (A + B)**

New Hampshire Department of Natural and Cultural Resources  
**RV Park Bathhouse Renovation**

**NOTE:** The Schedule of Values must be completely filled out in order for bid proposal to be considered responsive.

**SIGNATURE PAGE**

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

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

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

E-mail Address: \_\_\_\_\_

Signature of Authorized Bidder:

\_\_\_\_\_

Print: \_\_\_\_\_

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

Address of Bidder: \_\_\_\_\_  
(If different than company)

Names and Addresses of Members of the Firm/Corporation

Name \_\_\_\_\_ address \_\_\_\_\_

Name \_\_\_\_\_ address \_\_\_\_\_

Name \_\_\_\_\_ address \_\_\_\_\_

**SECTION 00 73 00**

**SUPPLEMENTARY CONDITIONS**

The General Conditions of this Contract are the American Institute of Architect's Document A201, "General Conditions of the Contract for Construction," Fourteenth Edition, 1987, 14 Articles, 24 pages, herein referred to as "AIA General Conditions."

**THE SUPPLEMENTARY CONDITIONS**

The Supplementary Conditions contain modifications, deletions, and/or additions to the AIA General Conditions. Where any part of the AIA General Conditions is modified, deleted or superseded by the Supplementary Conditions, the unaltered provisions shall remain in full effect.

**BIDDING REQUIREMENTS**

Bids shall only be accepted on the official Bid Proposal Forms, attached to these specifications. **Any bids submitted that are not on the official bid proposal forms will not be accepted.**

**CONDITIONS AT SITE OR BUILDING**

Bidders shall visit the site and be responsible for having ascertained pertinent local conditions such as: location, accessibility, general character of the site and the character and extent of existing work to remain, and any other work being performed thereon at the time of the submission of this bid.

**PERFORMANCE AND PAYMENT BOND**

In the event the bid is \$35,000 or more, the contractor shall furnish security by bond or otherwise in an amount equal to 100% of the contract guaranteeing performance and payment. The payment security shall meet the requirements of New Hampshire RSA 447:16.

The performance and payment bond must be returned with the signed contract within 15 days after the contract has been mailed or otherwise delivered to the bidder.

**PROPOSAL GUARANTEE**

The Contractor shall furnish a certified check or bid bond in the amount of 5% of the total amount of the Lump Sum Price made payable to the "Treasurer, State of New Hampshire" as a proposal guarantee. This proposal guarantee will be forfeited in the event that the contract is not executed. Personal checks will not be accepted.

**DETERMINATION OF RIGHT TO DO BUSINESS WITH STATE OF N.H.**

If selected as the low bidder, the bidder must be registered and have a certificate of existence from the Secretary of State, Corporate Division (telephone 603-271-3244) in order to do business with the State of New Hampshire.

**PROPOSAL SELECTION**

In most cases the proposal submitted by the qualified bidder with the lowest base bid price shall be selected. However, the Department of Natural and Cultural Resources (DNCR) reserves the right to

reject any or all proposals, or advertise for new proposals as it judges to be in the best interest of the state.

### **CONTRACTORS QUALIFICATIONS**

The successful bidder shall provide evidence upon request that they have been successfully performing this type, scale, and quality of work for a minimum of five years. Upon request, a comprehensive list of all similar projects worked on in the past two years by the general contractor shall be submitted along with contact information for 3 references of owner's representatives involved with three different projects completed by the contractor.

### **EXECUTION OF CONTRACT**

The Contractor's attention is called to the following:

**EXECUTION AND APPROVAL OF CONTRACT.** The contract shall be signed by the successful Bidder and returned, together with the contract bond, if applicable, within 15 days after the contract has been mailed or otherwise delivered to the Bidder. No contract shall be considered as in effect until it has been fully executed by all the parties thereto and, when the contract amount is more than \$10,000, the award has been concurred in by the Governor and Council.

**FAILURE TO EXECUTE CONTRACT.** Failure to execute the contract within 15 days after the contract has been mailed or otherwise delivered to the successful Bidder shall be just cause for the cancellation of the award and the forfeiture of the proposal guaranty which shall become the property of the Department, not as a penalty, but in liquidation of damages sustained. Award may then be made to the next lowest Bidder, or the work may be re-advertised as the Commissioner of DNCR may decide.

### **STARTING DATE**

The Contractor shall start work after the Notice to Proceed is received. The Notice to Proceed shall be issued immediately upon contract approval by the Governor and Council, and shall establish the actual construction start date. Failure to start work within 15 calendar days after the start date shall be considered a default of the contract. If the actual start date is later than the advertised start date, the completion date shall be extended by an equivalent number of working days.

### **WORKERS COMPENSATION INSURANCE**

Workers compensation insurance is required for all workers on the job site of this project. Per RSA 21-1:81-b At the onset of work on any NH state construction project, the general contractor or designated project construction manager, if any, shall provide to the Department Project Manager a current list of all subcontractors and independent contractors that the general contractor has agreed to use on the job site, with a record of the entity to whom that subcontractor is insured for workers compensation purposes. This list shall be posted on the jobsite and updated as needed to reflect any new subcontractors or independent contractors.

If it is determined that a subcontractor or independent contractor is present on a state construction site without the contractor's name and direct contracting relationship being posted in a visible location at the worksite, the general contractor or designated project manager shall require the subcontractor or independent contractor to provide the information within 36 hours and to post the information in a visible location at the worksite. If the information is not provided within 36 hours of its request, the general contractor shall suspend the contractor until the information is provided and posted.

### **PROTECTION OF EXISTING PROPERTY**

It shall be the responsibility of the contractor to protect existing property from damage. Any damage caused by the contractor in the performance of the work shall be repaired or replaced at his expense to

the satisfaction of the designated DNCR Project Manager.

## **CODES**

All work performed shall meet the provisions, if applicable, of the current New Hampshire State Building Code.

## **WORKMANSHIP**

All work shall be performed in a neat workmanlike manner by skilled workmen who have been actively engaged in performing the type of work specified under this contract for the last two years.

## **CLEAN-UP**

The site for this project is in a NH State Park and will be open to the public throughout the construction period. It is important to the Department of Natural and Cultural Resources that the site be maintained in a clean and presentable condition for the public. Therefore, all debris from the project shall be cleaned up daily and removed from the site at least on a weekly basis.

## **DEFAULT AND TERMINATION OF CONTRACT**

If the Contractor...

- a) Fails to begin the work under the contract within the time specified in the contract, or
- b) Fails to perform the work with sufficient workmen and equipment or with sufficient materials to assure the prompt completion of said work, or
- c) Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or
- d) Discontinues the prosecution of work, or
- e) Fails to resume work which has been discontinued, within reasonable time after notice to do so, or
- f) Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or
- g) Makes an assignment for the benefit of creditors, or
- h) For any other cause whatsoever, fails to carry on the work in an acceptable manner...

The Commissioner of DNCR will give notice in writing to the Contractor of such delay, neglect, or default.

If the Contractor or Surety does not proceed in accordance with the Notice, then the Commissioner will, upon written notification from the Project Manager of the fact of such delay, neglect or default, and the Contractor's failure to comply with such notice, have full power and authority without violating the contract, to take the prosecution of the work out of the hands of the Contractor. The Commissioner may enter into an agreement for the completion of said contract according to the terms and conditions thereof, or use such other methods as in his opinion will be required for the completion of said contract in an acceptable manner.

All extra costs and charges incurred by the Department as a result of such delay, neglect or default, together with the cost of completion of the work under the contract will be deducted from any monies due or which may become due said Contractor. If such expenses exceed the sum which would have been payable under the contract, then the Contractor and the Surety shall be liable and shall pay to the Department, the amount of such excess.

## **FAILURE TO COMPLETE THE WORK ON TIME**

If the Contractor fails to complete all of the work or sections of the Project, within the time specified in the Contract, the sum given in the schedule that follows will be deducted from any money due the Contractor. This deduction will be made, not as a penalty, but as fixed, agreed liquidation damages for inconvenience to the State and for reimbursing the Department the cost of the Administration of the Contract, including engineering and inspection. Should the amount of money otherwise due the Contractor be less than the amount of such liquidated damages, the Contractor and his Surety shall be liable to the State for such deficiency.

Permitting the Contractor to continue and finish the work after the time fixed for its completion, shall in no way obligate the State to waive any of its rights under the Contract.

When the final acceptance has been duly made by the Project Manager, any liquidated damage charges shall end.

The fixed, agreed, liquidated damages shall be assessed in accordance with the following schedule.

<u>ORIGINAL CONTRACT AMOUNT</u>		<u>AMOUNT OF LIQUIDATED DAMAGES PER WORKING DAY</u>
From more than:	to and including:	
\$0.00	\$25,000.00	\$ 300.00
\$25,000.00	\$50,000.00	\$ 400.00
\$50,000.00	\$100,000.00	\$ 500.00
\$100,000.00	\$500,000.00	\$ 600.00
\$500,000.00	-	\$ 800.00

## **SUBSTANTIAL COMPLETION & FINAL INSPECTION**

When the work is substantially complete, the Contractor shall submit to the Project Manager, a list of items of work to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents. On the basis of an inspection by the Project Manager which determines that the work is substantially complete, a Certificate of Substantial Completion shall establish the date of substantial completion and state the responsibilities for any damage to the work and insurance, and fix the time limit within which the Contractor shall complete the items listed herein. Warranties required by the Contract documents shall commence on the date of Substantial Completion unless otherwise provided in the Certificate of Substantial Completion.

If the Contractor fails to proceed to complete the items on the "punch list", then in addition to the corrective measures listed in the Certificate of Substantial Completion, the Commissioner may use the monies still due the Contractor to have such items completed and the Contractor shall lose any claim to the monies used.

Upon written notice that the Work is ready for final inspection and acceptance, the Project manager shall promptly make such inspection, and when he finds the Work acceptable under the Contract documents and the Contract fully performed, a Certificate of Final Payment will be issued.

Final inspection will be made by the Project Manager. Incomplete items necessary to complete the project shall be done prior to final payment.

## **GUARANTEE OF WORK**

1. Except as otherwise specified, all work shall be guaranteed by the Contractor against defects resulting from the use of inferior materials, equipment or workmanship for **one year** from the date of substantial completion of the work.
2. If, within any guarantee period, repairs or changes are required in connection with guaranteed work, which in the opinion of the Project Manager, is rendered necessary as a result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Commissioner, and at his own expense:
  - a. Place in satisfactory condition in every particular, all of such guaranteed work; correct all defects therein, and...
  - b. Make good all damage to the building or site, or equipment or contents thereof, which in the opinion of the Project Manager, is the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, and...
  - c. Make good any work or material, or the equipment and contents of said building or site disturbed in fulfilling any such guarantee.
3. In any case, wherein fulfilling the requirements of the Contract or of any guarantee, embraced in or required thereby, the Contractor disturbs any work guaranteed under another contract, he shall restore such disturbed work to a condition satisfactory to the Project Manager and guarantee such restored work to the same extent as it was guaranteed under such other contracts.
4. If the Contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Commissioner may have the defects corrected and the Contractor and his Surety shall be liable for all expense incurred.
5. All special guarantees applicable to definite parts of the work that may be stipulated in the specifications or other papers forming a part of the Contract shall be subject to the terms of this paragraph during the first year of the life of such special guarantee.

## **PROSECUTION OF WORK**

Upon starting the work within the 15 days set forth by this contract, the Contractor shall prosecute the work a minimum of 8 hours daily per working day until completion, excluding breakdowns or inclement weather. If the Contractor finds it impossible to start the work as stated above, he may make a written request to the Project Manager for an extension of time. Any such request shall be made prior to expiration of the allowable 15 days, and shall contain reasons which the Contractor believes will justify the granting of his request. In his request, the Contractor shall submit his proposed starting date.

## **CHANGES IN THE WORK**

The Project Manager may at any time, by a written order, and without notice to the Sureties, make changes in the Drawings and Specifications and completion date of this contract and within the general scope thereof.

In making any change, the additional cost or credit for the change shall be determined as follows:

- The order shall stipulate the mutually agreed upon lump sum price which shall be added to or deducted from the contract price. The contractor shall furnish an itemized breakdown of the prices used in computing the value of any change that might be ordered.
- If the price change is an addition to the contract price and the work is performed by the general

contractor and not a subcontractor, it shall include the contractor's indirect costs as follows: Workmen's Compensation and Employee Liability, Unemployment and Social Security Taxes.

- In addition to the above indirect costs, the general contractor shall be allowed a markup not to exceed ten percent (10%). Said ten percent (10%) shall be all inclusive for overhead, supervision, and profit. In addition to this, an allowance shall be made for performance and payment bond additional premiums.
- If the price change is an addition to the contract price and involves the work of the general contractor and subcontractor, the general contractor would be allowed ten percent (10%) on that part of the work performed by him and five percent (5%) on that part of the work performed by the subcontractor. The same percentages shall apply to subcontractors.
- On any change which involves a net credit to the Owner, no allowance for overhead and profit shall be figured.

### **INSURANCE REQUIREMENTS**

**No operations under this contract shall commence unless and until certification of insurance attesting to the below listed requirements have been filed with the Commissioner, approved by the Attorney General, and the Contract approved by the Governor and Council and a Notice to Proceed is issued.**

Insurance requirements by paragraphs 1-4 below shall be the responsibility of the Prime Contractor. The Prime Contractor, at his discretion, may make similar requests of any subcontractor.

Following is the summary of minimum insurance requirements:

- 1.) Workmen's Compensation Insurance (In accordance with RSA 281-A.)
  - a. Employers' Liability
    - 1.) \$100,000 each accident
    - 2.) \$500,000 Disease-policy limit
    - 3.) \$100,000 Disease-each employee
- 2.) Commercial General Liability Insurance: Occurrence Form Policy: Include full Contractual Liability (see Indemnification Clause 9), Explosion, Collapse, and Underground coverage's:
  - a. Limits of Liability:
    - 1.) \$1,000,000 Each Occurrence Bodily injury & Property Damage
    - 2.) \$2,000,000 General Aggregate-Include per Project Aggregate Endorsement
    - 3.) \$2,000,000 Products/Completed Operations Aggregate
    - 4.) State shall be named as an additional named insured.
- 3.) If blasting and/or demolition are required by the Contract, the Contractor or subcontractor shall obtain the respective coverage for those activities, and shall furnish to the Commissioner a certificate of Insurance evidencing the required coverage's prior to commencement of any operations involving blasting and/or demolition.
- 4.) Owner's Protective Liability coverage for the benefit of the State of New Hampshire Department of Natural and Cultural Resources.
  - a. Limits of Liability:
    - 1.) \$2,000,000 Each Occurrence
    - 2.) \$3,000,000 Aggregate
- 5.) Commercial Automobile Liability covering all motor vehicles including owned, hired, borrowed, and non-owned vehicles.



- a. Limits of Liability:
  - 1.) \$1,000,000 Combined Single Limit for Bodily injury & Property Damage
- 6.) Commercial Umbrella Liability
  - a. Limits of Liability:
    - 1.) \$1,000,000 Each Occurrence
    - 2.) \$1,000,000 Aggregate

7.) Builder's Risk Insurance (Fire and Extended Coverage):

The Contractor shall insure the work included in the Contract, including extras and change orders, on an "All Risk" basis, on a one hundred percent (100%) completed value basis of the Contract, as modified. Builder's Risk coverage shall include materials located at the Contractor's premises, on-site, in-transit, and at any temporary site. The policy by its own terms or by endorsement shall specifically permit partial or beneficiary occupancy prior to completion or acceptance of the entire work. The policies shall be in the names of the State of New Hampshire Department of Natural and Cultural Resources and the Contractor. The policies shall provide for the inclusion of the names of all other Contractors, Subcontractors, and others employed on the premises as insured's. The policies shall stipulate that the insurance companies shall have no right of subrogation against any Contractors, Subcontractors or other parties employed on the premises.

8.) General Insurance Conditions

Each policy shall contain a clause prohibiting cancellation or modifications of the policy earlier than thirty (30) days or ten (10) in cases of non-payment of premium after written notice thereof has been received by the State.

9.) Indemnification:

The Contractor shall indemnify, defend, and hold harmless the State of New Hampshire, its Agencies, and its agents and employees from and against any and all claims, liabilities, suits or penalties arising out of (or which may be claimed to arise out of) acts of omissions of the Contractor or subcontractors in the performance of work covered by the Contract. This covenant shall survive the termination of the Contract. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the State, which immunity is hereby reserved by the State.

**END OF SUPPLEMENTARY CONDITIONS**

**SECTION 01 10 00**

**SUMMARY**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Section includes:
  - 1. Project information.
  - 2. Work covered by Contract Documents.
  - 3. Work sequence.
  - 4. Access to site.
  - 5. Coordination with occupants.
  - 6. Work restrictions.
  - 7. Specification and drawing conventions.
  - 8. Miscellaneous provisions.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01 50 00: Temporary Facilities and Controls

**1.02 PROJECT INFORMATION**

- A. Project Identification: CAP 2018 RV Park Bathhouse Renovation
  - 1. Project Location: Ellacoya State Park, Gilford, New Hampshire
- B. Owner: State of New Hampshire, Department of Natural and Cultural Resources
  - 1. Owner's Representative: Scott Coruth, Architect

**1.03 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The Work of Project is defined by the Contract Documents and consists of the following:
  - 1. Renovations to the shower wing of the existing wood framed bathhouse to provide new single user showers, laundry and mechanical room. Renovation work includes; framing, doors and frames, finishes, siding, roofing, mechanical, electrical and plumbing work.
  - 2. New roofing on the entire existing building.
  - 3. New siding and weather barrier on the entire existing building.
  - 4. New interior finishes in the toilet room wing.
- B. Type of Contract: Project will be constructed under a stipulated lump sum grand total contract with the State of New Hampshire in accordance with the General Conditions of the Contract for Construction.

- C. The Contractor shall, except as otherwise specifically stated in Contract Documents, provide and pay for all materials, labor, tools, equipment, water, heat, fuel, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities or every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

**1.04 WORK SEQUENCE**

- A. Work shall commence within 15 days after issuance of Notice to Proceed. Failure to comply shall constitute a Default of Contract.

**1.05 ACCESS TO SITE**

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Limits: Confine construction operations to the area directly abutting the existing bathhouse.
2. Limits: Limit site disturbance, including earthwork and clearing of vegetation to 40-feet beyond building perimeter; 10-feet beyond surface walkways, patios, surface parking, and utilities less than 12-inches in diameter; 15-feet beyond primary roadway curbs and main utility branch trenches; and 25-feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas in order to limit compaction in the constructed area.
3. Driveways, Walkways and Entrances: Keep driveways, loading areas and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
  - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
  - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

**1.06 COORDINATION WITH OCCUPANTS**

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.

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1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
2. Provide not less than 72-hours' notice to Owner of activities that will affect Owner's operations.

**1.07 WORK RESTRICTIONS**

- A. Work restrictions, General: Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated.
1. Access for work outside of normal working hours shall be requested in writing to the Contract Administrator, at least one week in advance. The Contract Administrator may accept or reject the request.
  2. No access during the following observed holidays:
    - a. New Years' Day.
    - b. Martin Luther King Jr. Civil Rights Day.
    - c. Presidents Day.
    - d. Memorial Day.
    - e. Independence Day.
    - f. Labor Day.
    - g. Veterans' Day.
    - h. Thanksgiving Day.
    - i. Day after Thanksgiving.
    - j. Christmas Day.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
1. Notify Owner not less than two days in advance of proposed utility interruptions.
  2. Obtain Owners written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruptions to owner occupancy with owner.
1. Notify Owner not less than two days in advance of proposed disruptive operations.
  2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

**1.08 SPECIFICATION AND DRAWING CONVENTIONS**

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

**PART 2 – PRODUCTS (Not Used)**

**PART 3 – EXECUTION (Not Used)**

**END OF SUMMARY**

**SECTION 01 20 00**

**PRICE AND PAYMENT PROCEDURES**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Section Includes:
1. Schedule of Values
  2. Applications for Payment
  3. Allowances
  4. Alternates

**1.02 SCHEDULE OF VALUES**

- A. Submit printed schedule on AIA Form G703 – Continuation Sheet for G702. Contractor's standard form or electronic media printout will be considered as alternatives.
- B. Submit Schedule of Values in duplicate within 15 days after the date of issuance of Notice to Proceed. Failure to submit within specified time period will constitute Default of Contract.
- C. Utilize Table of Contents of these Specifications and any addenda as the basis of the Schedule of Values. Identify each line item with number and title of specification Section. Identify General Conditions, bonds and insurance.
- D. Include separate line item for the amount of each Allowance and Alternate Specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by unit cost to achieve total for each item.
- E. Revise schedule to list approved Change Orders, with each Application for Payment.

**1.03 APPLICATION FOR PAYMENT**

- A. Submit three copies of each application or electronic transmittal along with any supporting materials.
- B. Execute on AIA Form G702 – Application and Certificate for Payment.
- C. Items on the Application for payment shall be consistent with the items listed on the Proposal Form. Utilize Schedule of Values for listing items in Application for Payment.
- D. Submit updated construction schedule with each Application for Payment.
- E. Payment Period: Submit monthly, or as otherwise allowed by the Owner.

**1.04 ALLOWANCES**

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- A. Contingency Allowances: Use the allowance only as directed by Section 00 41 00 "Bid Proposal Form".
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

**PART 2 – PRODUCTS (Not Used)**

**PART 3 – EXECUTION (Not Used)**

**END OF PRICE AND PAYMENT PROCEDURES**

**SECTION 01 25 00**

**SUBSTITUTION PROCEDURES**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01 20 00: Price and Payment Procedures
  - 2. SECTION 01 60 00: Product Requirements

**1.02 DEFINITIONS**

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

**1.03 ACTION SUBMITTALS**

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



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

#### **1.04 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.

#### **1.05 PROCEDURES**

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

### **PART 2 – PRODUCTS**

#### **2.01 SUBSTITUTIONS**

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

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1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
  - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - b. Requested substitution provides sustainable design characteristics that specified product provided.
  - c. Substitution request is fully documented and properly submitted.
  - d. Requested substitution will not adversely affect Contractor's construction schedule.
  - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - f. Requested substitution is compatible with other portions of the Work.
  - g. Requested substitution has been coordinated with other portions of the Work.
  - h. Requested substitution provides specified warranty.
  - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed.

**PART 3 – EXECUTION (Not Used)**

**END OF SUBSTITUTION PROCEDURES**

**SECTION 01 26 00**

**CONTRACT MODIFICATION PROCEDURES**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01 20 00: Price and Payment Procedures
  - 2. SECTION 01 25 00: Substitution Procedures
  - 3. SECTION 01 30 00: Administrative Requirements

**1.02 MINOR CHANGES IN THE WORK**

- A. Architect will issue supplemental instructions (SI) authorizing minor changes in Work, not involving adjustment to the Contract Sum or the Contract Time.

**1.03 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 Specification.
  - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified by Proposal Request or 14 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 time before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for change to Architect.

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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 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 indicated effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available float time before requesting an extension of the Contract Time.
6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

**1.04 CHANGE ORDER PROCEDURES**

- A. On Owner's approval of a Work Change Proposal Request, Architect will issue a Contract Change Order for signatures of Owner and Contractor on Owner's standard form.

**1.05 CONSTRUCTION CHANGE DIRECTIVE**

- A. Construction Change Directive: Architect may issue a Construction Change Directive on Architects standard form. Construction Change Directive instructs Contractor to proceed with a change in Work, for subsequent inclusion in a Change Order.
  1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and materials basis of work required by the Construction Change Directive.
  1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

**PART 2 – PRODUCTS (Not Used)**

**PART 3 – EXECUTION (Not Used)**

**END OF CONTRACT MODIFICATION PROCEDURES**

**SECTION 01 30 00**

**ADMINISTRATIVE REQUIREMENTS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Section includes administrative provisions for coordinating construction operations, submittal procedures, delegated design, and Contractor's construction schedule including, but not limited to, the following:
  - 1. Project management and coordination
  - 2. Submittal procedures
  - 3. Delegated design
  - 4. Construction schedule
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01 70 00: Execution and Closeout Requirements

**1.02 PRECONSTRUCTION CONFERENCE**

- A. Soon after the actual award of the Contract (but in any event prior to the start of construction), the Contractor or his representative and his principal subcontractors shall attend a preconstruction conference with representatives of the Owner. The conference will serve to acquaint the participants with the general plan of contract administration and requirements under which the construction operation is to proceed.

**1.03 PROJECT MANAGEMENT AND COORDINATION**

- A. Subcontract List: Submit a written summary identifying individuals or firms proposed for each portion of the Work.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance AT Project site. List e-mail addresses and telephone numbers.
- C. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work.
- D. Requests for Information (RFIs): On discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI. Use forms acceptable to Architect.
- E. Schedule and conduct progress meetings at Project site at biweekly intervals. Notify Owner of meeting dates and times. Require attendance of each subcontractor or other entity concerned with current progress or involved in planning, coordination, or performance of future activities.

1. Contractor will record minutes and distribute to all attendees, including Owner/Architect.

**1.04 SUBMITTAL ADMINISTRATIVE REQUIREMENTS**

- A. Architect's Digital Data Files: Requests for Electronic digital data files of the Contract Drawings will be considered on a case by case basis and documents may be provided by Architect for Contractor's use in preparing submittals. Contractor is to submit request for specific drawing file pertinent to shop drawing preparation.
1. Architect may furnish Contractor specific digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
    - a. The decision to provide digital file data is at the sole discretion of the architect. No damages or claims will be accepted for failure to provide requested digital data.
    - b. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - c. Contractor shall execute a liability release and/or data licensing agreement in the form acceptable to the Architect.
- B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
1. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
  2. Architect will discard submittals received from sources other than Contractor.
- C. Paper Submittals: Place a permanent label or title block on each submittal for identification. Provide a space approximately on label or beside title block to record Contractor's review and approval markings and action taken by Architect. Include the following information on the label:
1. Project name.
  2. Date.
  3. Name and address of Contractor.
  4. Name and address of subcontractor or supplier.
  5. Number and title of appropriate Specification Section.
- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
  2. Name file with unique identifier, including project identifier, Specification Section number, and revision identifier.
  3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
- E. Identify options requiring selection by Architect.

- F. Identify deviations from the Contract Documents on submittals.
- G. Contractor's Construction Schedule Submittal Procedure:
  - 1. Submit required submittals in the following format:
    - a. Working electronic copy of schedule file, where indicated.
    - b. PDF electronic file
    - c. Three paper copies.
  - 2. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
  - 3. Coordinate Contractor's construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.

## **PART 2 – PRODUCTS**

### **2.01 SUBMITTAL PROCEDURES**

- A. General Submittal procedure Requirements: Prepare and submit submittals required by individual Specification Sections.
  - 1. Submit electronic submittals via email as PDF electronic files.
- B. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

### **2.02 ACTION SUBMITTALS**

- A. Submit two paper copies of each submittal unless otherwise indicated. Architect will return one copy.
- B. Product Data: Mark each copy to show applicable products and options. Include the following:
  - 1. Manufacturer's written recommendations, product specifications, and installation instructions.
  - 2. Wiring diagrams showing factory-installed wiring.
  - 3. Printed performance curves and operational diagrams.
  - 4. Testing by recognized testing agency.
  - 5. Compliance with specified standards and requirements.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data. Submit on sheets at least 8-1/2 by 11-inches but not larger than 24 by 36-inches. Include the following:
  - 1. Dimensions and identification of products.
  - 2. Fabrication and installation drawings and roughing-in and setting diagrams.

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3. Wiring diagrams showing field-installed wiring.
  4. Notation of coordination requirements.
  5. Notation of dimensions established by field measurement.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture and for comparison of these characteristics between submittal and actual component as delivered and installed. Include name of manufacturer and product name on label.
1. If variation is inherent in material or product, submit at least three sets of paired units that show variations.

**2.03 INFORMATIONAL SUBMITTALS**

- A. Informational Submittals: Submit two copies of each submittal unless otherwise indicated. Architect will return one copy.
- B. Qualification Data: Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

**2.04 DELEGATED DESIGN SERVICES**

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit four copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

**2.05 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, schedule in the format outlined in the General Conditions.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.



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- C. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
- D. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew size, and equipment required to achieve compliance, and indicate date by which recovery will be accomplished.

**PART 3 – EXECUTION**

**3.01 SUBMITTAL REVIEW**

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Architect will review each action submittal, make marks to indicate corrections or modification required, will signify each submittal with an action stamp, and will signify appropriately to indicate action.
- C. Informational Submittals: Architect will review each submittal and will return a copy. Architect will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

**3.02 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule a minimum of one day before each regularly scheduled progress meeting.
  - 1. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribute copies of approved schedule to Owner/Architect, subcontractors, testing and inspecting agencies, and parties identified by Contractor with a need-to-know schedule responsibility. When revisions are made, distribute updated schedules to the same parties.

**END OF ADMINISTRATIVE REQUIREMENTS**

**SECTION 01 40 00**

**QUALITY REQUIREMENTS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

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

**1.02 CONFLICTING REQUIREMENTS**

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

**1.03 QUALITY ASSURANCE**

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

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- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installation of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specification require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
  - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
  - 2. Notify Architect/Engineer seven days in advance of dates and times when mockups will be constructed.
  - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 4. Obtain Architect's/Engineer's approval of mockups before starting work, fabrication, or construction.
  - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  - 6. Demolish and remove mockups when directed, unless otherwise indicated.

#### **1.04 QUALITY CONTROL**

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
- C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspection.
  3. Adequate quantities of representative sample of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and of test samples.
  5. Delivery of samples to testing agencies.
- F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

#### **1.05 SPECIAL TESTS AND INSPECTIONS**

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of the Owner, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
2. Notify Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

**PART 2 – PRODUCTS (Not Used)**

**PART 3 – EXECUTION**

**3.03 REPAIR AND PROTECTION**

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with Contract Document requirements for cutting and patching in Section 01 70 00 "Execution and Closeout Requirements."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

**END OF QUALITY REQUIREMENTS**

**SECTION 01 50 00**

**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Use charges
    - b. Temporary utilities
    - c. Construction facilities
    - d. Temporary controls
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01 26 00: Contract Modification Procedures
  - 2. SECTION 01 70 00: Execution and Closeout Requirements

**1.02 USE CHARGES**

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

**1.03 INFORMATIONAL SUBMITTALS**

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

**1.04 QUALITY ASSURANCE**

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

**1.05 PROJECT CONDITIONS**

- A. The Contractor shall be permitted to utilize the existing Owner utilities at the site as limited by specific notes in the bidding documents. These utilities include electric power and water. The Contractor shall provide temporary sanitary facilities for the workmen, temporary cell phones and temporary fire safety devices such as fire extinguishers.

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

**PART 2 – PRODUCTS**

**2.01 TEMPORARY FACILITIES**

- A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

**2.02 EQUIPMENT**

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

**PART 3 – EXECUTION**

**3.01 INSTALLATION, GENERAL**

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

**3.02 TEMPORARY UTILITY INSTALLATION**

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
  - 1. Connect temporary sewers to Municipal or State system as directed by authorities having jurisdiction.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location,

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operation, and maintenance of fixtures and facilities. Permanent sanitary facilities installed under this Contract shall not be used during construction.

- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installation or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installation or elements being installed.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
  - 1. Prior to commencing work, isolate HVAC system in area where work is to be performed according to coordination drawings.
  - 2. Maintain dust partitions during Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
  - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installation or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- H. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

**3.03 SUPPORT FACILITIES INSTALLATION**

- A. General: Comply with the following:
  - 1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30-feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
  - 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

**3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION**



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- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in manner that will prevent people and animals from easily entering site except by entrance gate.
- D. Barricades, Warning Signs, and Lights: Comply with authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

**3.05 OPERATION, TERMINATION, AND REMOVAL**

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

**END OF TEMPORARY FACILITIES AND CONTROLS**

**SECTION 01 60 00**

**PRODUCT REQUIREMENTS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Section includes administrative and procedural requirements for selection of products for use in Project.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Product delivery, storage, and handling
    - b. Manufacturers' standard warranties
    - c. Special warranties
    - d. Comparable products
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01 20 00: Price and Payment Procedures
  - 2. SECTION 01 25 00: Substitution Procedures

**1.02 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 Products: 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.

**1.03 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. Note that no substitutions for convenience are allowed per Section 01 25 00.
1. Include data to indicate compliance with the requirements specified in “Comparable Products” Article.
  2. Architect’s Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of 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 01 30 00 “Administrative Requirements.”
    - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 30 00 “Administrative Requirements.”

#### **1.04 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.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

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

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

#### **1.06 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 Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
- a. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  - b. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  - c. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 70 00 "Execution and Closeout Requirements."

### **PART 2 – PRODUCTS**

#### **2.01 PRODUCT SELECTION PROCEDURES**

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  4. Where products are accompanied by the term “as selected”, Architect will make selection.
  5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- 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.
  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.
  5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers and/or products, 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 names. Comply with requirements in “Comparable Products” Article for consideration of an unnamed product by one of the other named manufacturers.
- C. 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.

## **2.02 COMPARABLE PRODUCTS**

- A. Conditions for Consideration: Architect will consider Contractor’s request for comparable products when the following conditions are satisfied. Note that substitutions for convenience are not allowed per Section 01 25 00. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

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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 PRODUCT REQUIREMENTS**

**SECTION 01 70 00**

**EXECUTION AND CLOSEOUT REQUIREMENTS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Section includes general administrative and procedural requirements governing execution and closeout of the Work including, but not limited to, the following:
  - 1. Execution
  - 2. Cutting and patching
  - 3. Cleaning
  - 4. Closeout procedures
- B. Related Work Specified Elsewhere:
  - 1. SECTION 01 10 00: Summary
  - 2. SECTION 01 30 00: Administrative Requirements

**1.02 EXECUTION REQUIREMENTS**

- A. Cutting and Patching:
  - 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching.
  - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.
  - 3. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the buildings aesthetic qualities.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

**1.03 CLOSEOUT SUBMITTALS**

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.
- C. Operation and Maintenance Data: Submit two copies of manual.
- D. PDF Electronic File: Assemble manual into a composite electronically indexed file. Submit on digital media.

- E. Record Drawings: Submit two sets of marked-up record prints.
- F. Record Product Data: Submit two paper copies and annotated PDF electronic files and directories of each submittal.

#### **1.04 SUBSTANTIAL COMPLETION PROCEDURES**

- A. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
- B. Submittals Prior to Substantial Completion: Before requesting Substantial Completion inspection, complete the following:
  - 1. Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 2. Submit closeout submittals specified in other Sections, including project record documents, operation and maintenance manuals, property surveys, similar final record information, warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 3. Submit maintenance material submittals specified in other Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect.
  - 4. Submit test/adjust/balance records.
  - 5. Submit Changeover information related to owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Before requesting Substantial Completion inspection, complete the following:
  - 1. Advise owner of pending insurance changeover requirements.
  - 2. Make final changeover of permanent locks and deliver keys to Owner.
  - 3. Complete startup and testing of systems and equipment.
  - 4. Perform preventative maintenance of equipment prior to Substantial Completion.
  - 5. Advise owner of changeover in heat and other utilities.
  - 6. Participate with owner in conducting inspection and walkthrough with local emergency responders.
  - 7. Remove temporary facilities and controls.
  - 8. Complete final cleaning requirements, including touchup painting.
  - 9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will proceed with inspection or advise Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will advise Contractor of items that must be completed or corrected before certificate will be issued.

#### **1.05 FINAL COMPLETION PROCEDURES**



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- A. Submittals Prior to Final Completion: Before requesting inspection for determining final completion, complete the following:
  - 3. Submit a final Application for Payment.
  - 4. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list). Certified copy of the list shall state that each item has been completed or otherwise resolved.
  - 5. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Submit a written request for final inspection and acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare final Certificate for Payment after inspection or will advise Contractor of items 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.

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
- B. 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.

**2.02 OPERATION AND MAINTENANCE DOCUMENTATION**

- 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 manuals into separate sections for each system and subsystem, and separate sections for each piece of equipment not part of a system.
- C. Organize data into three-ring binders with identification on front and spine of each binder, and envelopes for folded drawings. Include the following:
  - 1. Manufacturer's operation and maintenance documentation.
  - 2. Maintenance and service schedules.
  - 3. Maintenance service contracts. Include name and telephone number of service agent.
  - 4. Emergency instructions.
  - 5. Spare parts list and local source of maintenance materials.
  - 6. Wiring diagrams.

7. Copies of warranties. Include procedures to follow and required notifications for warranty claims.

## **2.03 RECORD DRAWINGS**

- A. Record Prints: Maintain a set of prints of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modification are issued. Mark to show actual installation where installation varies from that shown originally. Accurately record information in an acceptable drawing technique.
  1. Record drawings are to be updated at a minimum weekly.
  2. Review markings with Architect and Owner at Project Meetings.
  3. Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION AND PREPARATION**

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  1. Comply with the "Underground Utility Damage Prevention System" per NH RSA 374 by notification to DIG-SAFE SYSTEM, Inc., of intent to excavate within 100 feet of an underground utility. Contact DIG-SAFE at least seventy-two (72) hours in advance of starting any excavation.
- B. 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.
  1. Verify compatibility with and suitability of substrates.
  2. Examine roughing-in for mechanical and electrical systems.
  3. Examine walls, floors, and roofs for suitable conditions.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Take field measurements as required to fit the Work properly. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication.
- E. Verify space requirements and dimensions of items shown diagrammatically on Drawings.

### **3.02 CONSTRUCTION LAYOUT AND FIELD ENGINEERING**

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- A. Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks.
- B. Engage a land surveyor to lay out Work using accepted surveying practices.
- C. Engage a land surveyor to prepare a final property survey showing significant features (real property) for project and finish floor elevations.
  - 1. At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

**3.03 INSTALLATION**

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and horizontal work level.
  - 2. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  - 3. Maintain minimum headroom clearance of 96-inches in occupied spaces and 90-inches in unoccupied spaces, unless otherwise noted.
- B. Comply with manufacturer's written instructions and recommendations.
- C. 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.
- D. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed.
- E. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place. Where size and type of attachments are not indicated, verify size and type required for load conditions.
- F. Joints: Make joints uniform in 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.
- G. Use products, cleaners, and installation materials that are not considered hazardous.

**3.04 CUTTING AND PATCHING**

- A. Provide temporary support of work to be cut.
- B. 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.
- C. Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

- D. Cutting: Cut in-place construction using methods least likely to damage elements retained or adjoining construction.
  - 1. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
- E. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
  - 1. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction in a manner that will minimize evidence of patching and refinishing.
  - 2. 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.
  - 3. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.

### **3.05 CLEANING**

- A. Clean Project site and work areas daily, including common areas. Dispose of materials lawfully.
  - 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.
  - 3. Remove debris from concealed spaces before enclosing space.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion:
  - 1. Clean Project site, yard, and grounds, in areas disturbed by construction activities. Sweep paved areas; remove stains, spills, and foreign deposits. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
  - 2. Remove labels that are not permanent.
  - 3. Clean transparent materials, including mirrors. Remove excess glazing compounds.
  - 4. Clean exposed finishes to a dust-free condition, free of stains, films, and foreign substances. Sweep concrete floors broom clean.
  - 5. Vacuum carpeted surfaces and wax resilient flooring.
  - 6. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and foreign substances. Clean plumbing fixtures. Clean light fixtures, lamps, globes, and reflectors.
  - 7. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

### **3.06 OPERATION AND MAINTENANCE MANUAL PREPARATION**

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- A. 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.
- B. Manufacturer's Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
  - 1. Prepare supplementary text if manufacturers' standard printed data are unavailable and where the information is necessary for proper operation and maintenance of equipment or systems.
- C. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams.

**3.07 DEMONSTRATION AND TRAINING**

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system. Include detailed review of the following:
  - 1. Include instructions for basis of system design and operational requirements, review of documentation, emergency procedures, operations, adjustments, troubleshooting, maintenance, and repairs.

**END OF EXECUTION AND CLOSEOUT REQUIREMENTS**

**SECTION 02 41 19**

**SELECTIVE DEMOLITION**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to provide all Selective Demolition as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.

The Work of this Section is not necessarily fully represented on the Drawings or specifically identified herein. The Contractor, either himself or through his various subcontractors, shall thoroughly review all documents and shall visit the site and existing building prior to bidding, as required to fully satisfy himself as to the types, locations and quantities of demolition work required for the complete and proper execution of the Work. No pleas of misunderstanding resulting from failure to adequately inspect existing conditions will be entertained and no additional expenses related thereto will be granted.

1. The Work shall include, but shall not necessarily be limited to:
  - a. Salvage of designated items
  - b. Protection of site work and adjacent items
  - c. Disconnection, capping, and removal of utilities
  - d. Pollution control during building and selective demolition, including noise control
  - e. Selective demolition of interior partitions, systems, and building components designated to be removed.
  - f. Selective demolition of exterior façade, structures, and components designated to be removed.
  - g. Protection of portions of building adjacent to or affected by selective demolition
  - h. Removal of abandoned utilities and wiring systems
  - i. Notification to Owner of schedule of shut-off of utilities which serve occupied spaces.
  - j. Removal and legal disposal of materials
  - k. Protection of designated site improvements and adjacent construction
  - l. Interruption, capping or removal of utilities as applicable

**1.02 DEFINITIONS**

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

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- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

**1.03 MATERIALS OWNERSHIP**

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

**1.04 SUBMITTALS**

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
  - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit before Work begins.
- D. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.
- E. Closeout Submittals: Submit a list of items that have been removed and salvaged.

**1.05 QUALITY ASSURANCE**

- A. Codes and Regulations: Comply with governing codes and regulations. Use experienced workers.

**1.06 PROJECT CONDITIONS**

- A. Notify Owner of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- B. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. Hazardous materials will be removed by Owner before start of the Work.

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2. If suspected hazardous materials are encountered, do not disturb; immediately notify Owner. Hazardous materials will be removed by Owner under a separate contract.
- C. Storage or sale of removed items or materials on-site is not permitted.
- D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.

**1.07 COORDINATION**

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

**PART 2 – PRODUCTS**

**2.01 PERFORMANCE REQUIREMENTS**

- A. Regulatory Requirements: Comply with governing EPA notification regulation before beginning selective demolition. Comply with hauling and disposal regulation of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- E. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs or video.



**3.02 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS**

- A. Existing Services/Systems to Remain: Maintain services/systems to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  - 2. Arrange to shut off utilities with utility companies.
  - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  - 4. Disconnect, demolish, and remove plumbing and HVAC systems, equipment, and components indicated on Drawings to be removed.
    - a. Piping to be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
    - c. Equipment to be Removed: Disconnect and cap services and remove equipment.
    - d. Equipment to be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    - e. Ducts to be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
    - f. Ducts to be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

**3.03 PROTECTION**

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.

- C. Remove temporary barricades and protections where hazards no longer exist.

**3.04 SELECTIVE DEMOLITION, GENERAL**

- A. General: Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  5. Maintain fire watch during and for at least two hours after flame-cutting operations.
  6. Maintain adequate ventilation when using cutting torches.
  7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose off-site.
  8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  10. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
  2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

**3.05 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS**

- A. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section 07 31 13 "Asphalt Shingles" for new roofing requirements.

**3.06 DISPOSAL OF DEMOLISHED MATERIALS**

- A. Remove demolition waste materials from Project site and recycle or dispose of them.
1. Do not allow demolished materials to accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.

**3.07 CLEANING**

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

**END OF SELECTIVE DEMOLITION**

**SECTION 05 52 13**

**PIPE AND TUBE RAILINGS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Metal Railings as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Steel pipe and tube railings

**1.02 ACTION SUBMITTALS**

- A. Product Data: For the following:
  - 1. Steel pipe for use as railings.
  - 2. Railing brackets.
  - 3. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the licensed structural engineer responsible for their preparation.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.
- B. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

**1.04 QUALITY ASSURANCE**

- A. Manufacturers Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years' experience.
- B. Installer Qualifications: All products in this section are to be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code – Steel."

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

**1.06 PROJECT CONDITIONS**

- A. Field Measurements: Where handrails and railings are indicated to fit other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings.

**1.07 WARRANTY**

- A. Provide manufacturer's standard limited warranty against manufacturing defects, outlining its terms, conditions, and exclusions from coverage.

**PART 2 – PRODUCTS**

**2.01 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a licensed structural engineer to design railings, including attachment to building construction.
- B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  1. Handrails and Top Rails of Guards:
    - a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
    - b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

**2.02 METALS, GENERAL**

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

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1. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

**2.03 STEEL AND IRON**

- A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.
- B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
  1. Provide galvanized finish for exterior installations and where indicated.
- C. Plates, Shapes, and bars: ASTM A 36/A 36M.

**2.04 FASTENERS**

- A. General: Provide the following:
  1. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
  2. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 448/E 448M, conducted by a qualified independent testing agency.

**2.05 MISCELLANEOUS MATERIALS**

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Etching Cleaner for Galvanized Metal: Comply with MPI#25.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

**2.06 FABRICATION**

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

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- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with welded connections unless otherwise indicated.
- H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including fittings.
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove flux immediately.
  - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- I. Close exposed ends of railing members with prefabricated end fittings.
- J. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
  - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

**2.07 FACTORY APPLIED ARCHITECTURAL FINISH OVER GALVANIZED STEEL**

- A. The following miscellaneous metal fabrications shall receive factory applied architectural finish over hot-dip galvanizing:
  - 1. All exterior rails
  - 2. All exterior bollards
- B. Basis-of-Design: Colorgalv by Duncan Galvanizing.

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- C. Primer coat shall be factory-applied polyamide epoxy primer. Apply primer within 12 hours after galvanizing at the same galvanizer's plant in a controlled environment meeting applicable environmental regulations and as recommended by the primer coating manufacturer.
- D. Finish coat shall be factory-applied color-pigmented architectural finish. Apply finish coating at the galvanizer's plant, in a controlled environment meeting applicable environmental regulations and as recommended by the finish coating manufacturer.
- E. Coatings shall be certified OTC/VOC compliant and conform to applicable regulations and EPA standards.
- F. Apply the galvanizing, primer, and coating within the same facility and provide single-source responsibility for galvanizing, priming and finish coating.
- G. Clean galvanized surface to create an acceptable profile for coatings. Galvanizer shall certify that performance will be met without blast cleaning and coating will be applied within 12 hours of galvanizing at the galvanizer's plant. If blasted, galvanizer shall certify that rugosity standards are met.
- H. Primer shall meet or exceed the following performance criteria:
  - 1. Abrasion Resistance: ASTM D 4060 (CS17 Wheel, 1,000 grams load) 1 kg load, 200 mg loss.
  - 2. Adhesion: ASTM D 4541, 1050 psi.
  - 3. Corrosion Weathering: ASTM D 5894, 13 cycles, 4,368 hours, 10 per ASTM D 714 for blistering; 7 per ASTM D 610 for rusting.
  - 4. Direct Impact Resistance: ASTM D 2794, 160 in. lbs.
  - 5. Flexibility: ASTM D 522, 180 degrees bend, 1 inch mandrel, Passes.
  - 6. Pencil Hardness: ASTM D 3363, 3H.
  - 7. Moisture Condensation Resistance: ASTM D 4585, 100 degrees F, 2000 hours, Passes no cracking or delamination.
  - 8. Dry Heat Resistance: ASTM D 2485, 250 degrees F.
  - 9. Accelerated Weathering: QUV- ASTM D 4587 QUV A 5000 Hours: Passes.
  - 10. Salt Fog Resistance: ASTM B 117, 5,600 hours No cracking or blisters.
- I. Topcoat shall meet or exceed the following performance criteria:
  - 1. Abrasion Resistance: ASTM D 4060, CS17 Wheel, 1,000 cycles 1 kg load, 87.1 mg loss.
  - 2. Adhesion: ASTM D 4541, 1050 psi.
  - 3. Direct Impact Resistance: ASTM D 2794, greater than 28 in. pounds.
  - 4. Dry Heat Resistance: ASTM D 2485, 200 degrees F (93 C).
  - 5. Salt Fog Resistance: ASTM B 117 9,000 hours, Rating 10 per ASTM D 714 for blistering, Rating 9 per ASTM D 610 for rusting.
  - 6. Flexibility: ASTM D522, 180 degrees bend, 1/8 inch mandrel, Passes.
  - 7. Pencil Hardness: ASTM D 3363, F.
  - 8. Moisture Condensation Resistance: ASTM D 4585, 100 degrees F, 1000 hours, No blistering or delamination.
  - 9. Xenon Arc Test: ASTM D 4798, Pass 200 hours.



10. Corrosion Weathering: ASTM D 5894, 21 Cycles, 7056 Hours: Rating 10 per ASTM D714 for blistering. Rating 9 Per ASTM D 610 for Rusting.
  11. Thermal Shock: ASTM D 2246, 15 cycles, Excellent.
- J. Topcoat shall exhibit a rugosity (smoothness) 4 rug or less (16-20 microns of variation) when measured by a profilometer over a 1 inch straight line on the surface of elements that are less than 24 pounds per running foot. Profilometer shall be capable of operating in 1 micron increments.
- K. Warranty: Provide galvanizer's standard warranty that materials will be free from 10 percent or more visible rust for 20 years.

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine plaster and gypsum board assemblies where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

#### **3.02 INSTALLATION, GENERAL**

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment and elevation; measured from established lines and levels and free of rack.
1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
  2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
  3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed ¼ inch in 12 feet.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum or steel that are in contact with grout, concrete, masonry, wood, or dissimilar metals.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

#### **3.03 RAILING CONNECTIONS**

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- A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

**3.04 ADJUSTING AND CLEANING**

- A. Clean by washing thoroughly with clean water and soap and rinsing with clean water.
- B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surface.
  - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

**3.05 PROTECTION**

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

**END OF METAL RAILINGS**

**SECTION 06 10 00**

**ROUGH CARPENTRY**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Rough Carpentry as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job. It is not intended that this Section specifically identify all Rough Carpentry required.
1. The Work shall include, but shall not necessarily be limited to:
- a. Framing with dimensional lumber
  - b. Wood blocking, cants, and nailers
  - c. Wood furring and grounds
  - d. Wood sleepers
  - e. Wood underlayment, decking and sheathing
  - f. Anchors and fasteners
- B. Related Work Specified Elsewhere:
- 1. SECTION 06 20 00: Finish Carpentry
  - 2. SECTION 07 60 00: Flashing and Sheet Metal
  - 3. SECTION 08 71 00: Door Hardware
  - 4. SECTION 10 14 00: Signage
  - 5. SECTION 10 28 00: Toilet, Bath and Laundry Specialties

**1.02 DEFINITIONS**

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- C. Lumber grading agencies, and the abbreviations used to reference them, include the following:
- 1. NeLMA: Northeastern Lumber Manufacturers' Association
  - 2. NLGA: National Lumber Grades Authority
  - 3. RIS: Redwood Inspection Service
  - 4. SPIB: The Southern Pine Inspection Bureau
  - 5. WCLIB: West Coast Lumber Inspection Bureau
  - 6. WWPA: Western Wood Products Association

**1.03 SPECIAL CONDITIONS**

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- A. The Contractor shall carefully review the Drawings for additional technical requirements and details related to the Work of this Section. Particular attention shall be paid to the structural characteristics of framing materials.
- B. The Contractor shall be responsible for carefully examining existing framing to remain, verifying that it is structurally sound and suitable for continued use and notifying the Owner upon the discovery of any conditions which suggest that existing materials may be rotted, checked, warped, termite infested, improperly installed or otherwise unsuitable for continued use.
- C. Coordinate the location of framing, blocking, nailers, furring, grounds, and similar supports for finish materials, millwork, casework, finish carpentry, equipment, hardware and accessories so that the installation of finish work may be properly executed in compliance with the intended design requirements. Before starting installation of supports, carefully check all related shop drawings and submittals.

**1.04 ACTION SUBMITTALS**

- A. Lumber & Sheathing Schedule: Indicating lumber and sheathing sizes, species and grade, grading agency, moisture content and application location.
- B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details. MSDS sheets are not required to be submitted.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirement. Indicate type of preservative used and net amount of preservative retained.
  - 2. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
  - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

**1.05 INFORMATIONAL SUBMITTALS**

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board or Review.
- B. Evaluation Reports: For the following, from ICC-ES:
  - 1. Wood-preservative-treated wood
  - 2. Power-driven fasteners
  - 3. Metal framing anchors

**1.06 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.

**1.07 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**

**2.01 WOOD PRODUCTS, GENERAL**

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board or Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency
  2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  3. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent for 2-inch nominal thickness or less, no limit for more than 2-inch nominal thickness unless otherwise indicated.
- C. Wood Structural Panels:
1. Plywood: PS 1, PS2 or APA PRP-108
  2. Oriented Strand Board: PS 1, PS2 or APA PRP-108

**2.02 WOOD-PRESERVATIVE-TREATED LUMBER**

- 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.
  2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that 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.

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1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.
- D. Application: Treat items indicated on Drawings, and the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
  2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
  3. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.

**2.03 DIMENSION LUMBER FRAMING**

- A. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 3 grade.
1. Application: Interior partitions not indicated as load-bearing.
  2. Species: Spruce-pine-fir; NLGA, NeLMA, WCLIB, or WWPA
- B. Joists, Rafters, and Other Framing Not Listed Above: No.1 grade
1. Species: Spruce-pine-fir; NLGA, NeLMA, WCLIB, or WWPA

**2.04 MISCELLANEOUS LUMBER**

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking
  2. Nailers
  3. Furring
- B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber and any of the following species:
1. Hem-fir (north); NLGA
  2. Mixed southern pine; SPIB
  3. Spruce-pine-fir; NLGA
  4. Hem-fir; WCLIB or WWPA
  5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA
  6. Western woods; WCLIB or WWPA
  7. Northern species; NLGA
  8. Eastern softwoods; NeLMA
- C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:

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1. Mixed southern pine; No. 3 grade; SPIB
  2. Hem-fir or hem-fir (north); Standard or No. 3 Common grade; NLGA, WCLIB, or WWPA
  3. Spruce-pine-fir (south) or spruce-pine-fir; Standard or No. 3 Common grade; NeLMA, NLGA, WCLIB, or WWPA
  4. Eastern softwoods; No. 3 Common grade; NeLMA
  5. Northern species; No. 3 Common grade; NLGA
  6. Western woods; Standard or No. 3 Common grade; WCLIB or WWPA
- D. For blocking not used for attachment of other construction, Utility, Stud or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

**2.05 SHEATHING**

- A. Softwood plywood shall conform to the requirements of the latest edition of U.S. Product Standard PS-1, Construction and Industrial.
- B. Plywood thicknesses shall be as scheduled below, unless specifically noted otherwise on the Drawings.
1. Exterior Plywood Wall Sheathing: 1/2-inch; APA Rated, Exposure 1 sheathing
  2. Plywood Subflooring: 3/4-inch; APA Rated, Sturd-I-Floor, Tongue and Groove, Exposure 1 sheathing. Select span rating as required for specific job conditions.
  3. Floor Underlayment: APA Rated, Underlayment, Exposure 1 sheathing. Provide underlayment in thicknesses indicated or, if not indicated, not less than 1/4-inch over smooth subfloors and not less than 3/8-inch over board or uneven subfloors.
  4. Interior Wall Backing: 1/2-inch APA Rated, fire-retardant-treated sheathing
  5. Miscellaneous Plywood (not specified elsewhere): Shall conform to the general applications and corresponding grades of softwood plywood as published in U.S. Product Standard PS-1 and shall be selected by means of its intended use, subject to Owner's approval.

**2.06 PLYWOOD BACKING PANELS**

- A. Equipment Backing Panels: DOC PS 1, Exterior, C-C Plugged Exposure 1, or C-D Plugged, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

**2.07 FASTENERS**

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

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1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers. All components to have a galvanized finish.

**2.08 METAL FRAMING ANCHORS**

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
  1. Cleveland Steel Specialty Co.
  2. Simpson Strong-Tie Co., Inc.
  3. USP Structural Connectors
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653 M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel TYPE B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
- D. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.
  1. Strap width: 1-1/2 inches
  2. Thickness: 0.062 inch
- E. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch above base and with 2-inch minimum side cover, socket 0.062 inch thick, and standoff and adjustment plates 0.108 inch thick.

**2.09 MISCELLANEOUS MATERIALS**

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, 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.



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- B. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
  - 1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Water-Repellent Preservative: NWWDA-tested and –accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with and insecticide containing chlorpyrifos as its active ingredient.

**PART 3 – EXECUTION**

**3.01 INSTALLATION, GENERAL**

- A. Set rough carpentry to required level and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. 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.
- D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- E. Do not splice structural members between supports unless otherwise indicated.
- F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- G. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
  - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
  - 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal-thickness.

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3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
  4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.
- H. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- I. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
1. Use inorganic boron for items that are continuously protected from liquid water
  2. Use copper naphthenate for items not continuously protected from liquid water
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. NES NER-272 for power-driven fasteners
  2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code
- K. Use hot-dipped galvanized steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
1. Comply with approved fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic or cardboard.
  2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
  3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

**3.02 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION**

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attached items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

**3.03 WALL AND PARTITION FRAMING INSTALLATION**

- A. General: Provide double bottom plates and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single bottom plate and top plate may be used for non-load-bearing partitions and a single top plate for load-bearing partitions where framing members bearing on partition are located directly over studs. Fasten plates to supporting construction unless otherwise indicated.
  - 1. For interior partitions and walls, provide 2-by-6 inch nominal- or 2-by-4 inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.
  - 2. Provide continuous horizontal blocking at midheight of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partition.
- B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.
- C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
  - 1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal depth for openings 48 inches and less in width, 6-inch nominal depth for openings 48 to 72 inches in width, 8-inch nominal depth for openings 72 to 120 inches in width, and not less than 10-inch nominal depth for openings 10 to 12 feet in width.

**3.04 PROTECTION**

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

**END OF ROUGH CARPENTRY**

**SECTION 06 20 00**

**FINISH CARPENTRY**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Finish Carpentry as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
- a. Exterior standing and running trim
  - b. Interior standing and running trim
  - c. PVC trim
- B. Related Work Specified Elsewhere:
- 1. SECTION 06 10 00: Rough Carpentry
  - 2. SECTION 06 40 00: Architectural Woodwork
  - 3. SECTION 07 46 23: Wood Siding
  - 4. SECTION 07 62 00: Sheet Metal Flashing and Trim
  - 5. SECTION 09 91 00: Painting
  - 6. SECTION 09 93 00: Staining and Transparent Finishing

**1.02 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.
- B. Samples for Initial Selection: For each type of product involving selection of colors, profiles, or textures.
- C. Evaluation Reports: For the following, from ICC-ES:
- 1. Cellular PVC trim

**1.03 QUALITY ASSURANCE**

- A. Perform work in accordance with AWI AWS Section 6 grades identified in Section.
- B. Surface Burning Characteristics: Comply with the following when tested in accordance with NFPA 286.
- 1. During 40 kW Exposure: No flame spread to ceiling.
  - 2. During 160 kW Exposure: No flame spread to perimeter of tested sample and no flashover.

3. Total Smoke Release: Maximum 1,000 cu m
- C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years' experience.
- D. Fabricator Qualifications: Company specializing in fabricating products specified in this section with minimum three years' experience. Shop is a certified participant in AWI's Quality Certification Program.

#### **1.04 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

#### **1.05 PROJECT CONDITIONS**

- A. Weather Limitations for Exterior Work: 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.
- 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.

#### **1.06 WARRANTY**

- A. Manufacturer's Warranty for Cellular PVC Trim: Manufacturer agrees to repair and replace trim that fails due to defects in manufacturing within specified warranty period. Failures include, but are not limited to, deterioration, delamination, and excessive swelling from moisture.
  1. Warranty Period: 25 years from date of Substantial Completion

### **PART 2 – PRODUCTS**

#### **2.01 MATERIALS, GENERAL**

- A. Environmental Quality Characteristics:
  1. Adhesives: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168; adhesives shall not contain urea formaldehyde
  2. Aerosol Adhesives: Maximum volatile organic compound content in accordance with GS-36
  3. Flat and Non-Flat Paints: Maximum volatile organic compound content in accordance with GS-11
  4. Composite Wood Products: Contain no added urea-formaldehyde resins

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- B. VOC Limits for Installation Adhesives: Installation adhesives shall comply with the following limits for VOC content when calculated according to 40 CFR 59, subpart D (EPA Method 24):

1. Wood Glues: 30 g/L
2. Multipurpose Construction Adhesives: 70 g/L
3. Contact Adhesive: 250 g/L

**2.02 EXTERIOR MATERIALS**

- A. Exterior Plastic Boards and Panels: Extruded, expanded PVC with a small-cell microstructure, recommended by manufacturer for exterior use, made from UV- and heat-stabilized, rigid material.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. CertainTeed Corporation; CertainTeed Restoration Millwork
  - b. Vycom Corp.; Azek
  - c. Fypon Ltd.; Fypon PVC
2. Density: Not less than 31 lb/cu. Ft.
3. Heat Deflection Temperature: Not less than 130 deg F, according to ASTM D 648
4. Coefficient of Thermal Expansion: Not more than  $4.5 \times 10^{-5}$  inches/inch x deg F
5. Water Absorption: Not more than 1 percent, according to ASTM D 570
6. Flame-Spread Index: 75 or less, according to ASTM E 84

**2.03 INTERIOR MATERIALS**

- A. Interior Plastic Boards and Panels: Extruded, expanded PVC with a small-cell microstructure, recommended by manufacturer for interior use, made from UV- and heat-stabilized, rigid material.

1. Density: Not less than 31 lb/cu. Ft.
2. Heat Deflection Temperature: Not less than 130 deg F, according to ASTM D 648
3. Coefficient of Thermal Expansion: Not more than  $4.5 \times 10^{-5}$  inches/inch x deg F
4. Water Absorption: Not more than 1 percent, according to ASTM D 570
5. Flame-Spread Index: 75 or less, according to ASTM E 84

**2.04 FABRICATION**

- A. Fabricate finish carpentry to AWI AWS Section 6 Custom Grade
- B. Shop assemble work for delivery to Site, permitting passage through building openings.
- C. When necessary to cut and fit on site, fabricate materials with ample allowance for cutting. Furnish trim for scribing and site cutting.

**2.05 ACCESSORIES**

- A. Wall Adhesive: Cartridge type, compatible with wall substrate, capable of achieving durable bond.
- B. Fasteners and Anchors:

1. Fasteners: ASTM A153/A153M, hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
  2. Nails and Staples: ASTM F1667
- C. Concealed Joint Fasteners: Threaded steel
- D. Specialty plastic or PVC plugs to conceal countersunk screws in PVC trimwork.
- E. Adhesive for Cellular PVC Trim: Product recommended by trim manufacturer.

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this Section are placed and ready to receive this work.
- C. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 PREPARATION**

- A. Clean substrates of projections and substances detrimental to application.

#### **3.03 INSTALLATION**

- A. Install work in accordance with AWI AWS Section 6 and Custom Grade and manufacturer's instructions.
- B. Set and secure materials and components in place, plumb and level.
- C. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
1. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
  2. Coordinate exterior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.
- D. Carefully scribe work abutting other components, with maximum gaps of 1/32-inch. Do not use additional overlay trim to conceal larger gaps.
- E. Install cellular PVC trim to comply with manufacturer's written instructions.

1. Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24-inches long except where necessary.
  - a. Use scarf joints for end-to-end joints.
  - b. Stagger end joints in adjacent and related members.
  - c. Fit exterior joints to exclude water. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.
  - d. All exterior fasteners are to be countersunk and plugged with specialty PVC plugs designed for this purpose.
- F. Standing and Running Trim: Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available to greatest extent possible. Do not use pieces less than 96-inches long except where necessary.
  1. Use scarf joints for end-to-end joints.
  2. Stagger end joints in adjacent and related members.
  3. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.
  4. Install standing and running trim with no more variation from a straight line than 1/8-inch in 96-inches.

### **3.04 TOLERANCES**

- A. Conform to AWI AWS Section 6 requirements for the following:
  1. Smoothness
  2. Gaps
  3. Flushness
  4. Flatness
- B. Maximum Variation from Indicated Position: 1/16-inch.
- C. Maximum Offset from Alignment with Abutting Materials: 1/32-inch.

**END OF FINISH CARPENTRY**



**SECTION 06 40 00**

**ARCHITECTURAL WOODWORK**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Architectural Woodwork as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Architectural cabinet tops
- B. Related Work Specified Elsewhere:
  - 1. SECTION 06 10 00: Rough Carpentry
  - 2. SECTION 06 20 00: Finish Carpentry
  - 3. SECTION 09 91 00: Painting
  - 4. SECTION 09 93 00: Staining and Transparent Finishing

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product, including panel products, decorative laminates, adhesives, cabinet hardware and accessories.
  - 1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment device, and other components.
  - 1. Show details full size.
  - 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
  - 3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural woodwork.
  - 4. Apply AWI Quality Certification Program label to Shop Drawings.
- C. Samples for Initial Selection:
  - 1. Plastic laminates

**1.03 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of product.

- C. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- D. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

#### **1.04 QUALITY ASSURANCE**

- A. Fabricator Qualifications: 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. Shop is a certified participant in AWI's Quality Certification Program.
- B. 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.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver woodwork until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

#### **1.06 PROJECT CONDITIONS**

- A. Environmental Conditions: Obtain and comply with Woodwork Manufacturer's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.
- B. Established Dimensions: Where indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

### **PART 2 – PRODUCTS**

#### **2.01 GENERAL**

- A. All materials shall meet or exceed all applicable reference standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.

#### **2.02 HIGH-PRESSURE DECORATIVE LAMINATE**

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

1. Formica Corporation
2. Wilsonart International
3. Panolam Industries International, Inc.

**2.03 WOODWORK MATERIALS**

- A. Provide materials that comply with requirements of the AWI woodworking standard for each type of woodwork and quality grade indicated and, where the following products are part of woodwork, with requirements of the referenced product standards, that apply to product characteristics indicated:

1. High Pressure Laminate: NEMA LD 3
2. Softwood Plywood: PS 1
3. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:
  - a. Hardwood Plywood: Hardwood Plywood and Veneer Association.

**2.04 FABRICATION, GENERAL**

- A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of lumber in relation to relative humidity conditions existing during time of fabrication and in installation areas.
- B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
1. Corners of cabinets and edges of solid wood (lumber) members less than 1-inch in nominal thickness: 1/16-inch.
  2. Edges of rails and similar members more than 1-inch in nominal thickness: 1/8-inch.
- C. Complete fabrication, including assembly, finishing, 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 the Project site, provide ample allowance for scribing, trimming, and fitting.

**2.05 ARCHITECTURAL CABINET TOPS (COUNTERTOPS)**

- A. Quality Standard: Comply with AWI Section 400 and its Division 400C.
- B. Type of Top: High pressure decorative laminate over exterior grade plywood (no particleboard) core complying with the following:
1. Grade: Premium
  2. Laminate Cladding for Horizontal Surface: High pressure decorative laminate as follows:

- a. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
  - i. Provide selections made by Owner from manufacturer's full range of standard colors and finishes in the following categories: Solid colors, Wood grains, patterns.
- b. Grade: HGS 0.048-inch thickness
- c. Grain Direction: Parallel to longest dimension unless indicated otherwise.
- 3. Edge Treatment: As indicated.

## **2.06 MISCELLANEOUS MATERIALS**

- A. Fasteners: Size and type to suit application
- B. Bolts, Nuts, Washers, Lags, pins, and Screws: Of size and type to suit application; galvanized or chrome plated finish in concealed locations and stainless steel, or chrome plated finish in exposed locations.
- C. Concealed Joint Fasteners: Threaded steel.
- D. Adhesives: Type recommended by AWI/AWMAC to suit application.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.
- B. Before installing architectural woodwork, examine shop fabricated work for completion and complete work as required, including back priming and removal of packing.

### **3.02 INSTALLATION**

- A. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
- B. All installation shall be in accordance with manufacturer's published recommendations.
- C. Quality Standard: Install woodwork to comply with AWI Section 1700 for same grade specified in Part 2 of this section for type of woodwork involved.
- D. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8-inch in 8-feet for plumb and level (including tops) and in no variations in flushness of adjoining surfaces.
- E. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.

- F. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.
- G. Tops: Anchor securely to base units and other support systems as indicated.
- H. Complete the finishing work specified in this Section to whatever extent not completed at shop or before installation of woodwork.

**3.03 ADJUSTING AND CLEANING**

- A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean woodwork on exposed and semi-exposed surfaces. Touch up factory applied finishes to restore damaged or soiled areas.

**3.04 PROTECTION**

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, which ensures that woodwork is without damage or deterioration at time of Substantial Completion.

**END OF ARCHITECTURAL WOODWORK**

**SECTION 06 61 16**

**SOLID SURFACING FABRICATIONS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Solid Surfacing Fabrications as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Countertops and sinks
    - b. Backsplashes, sideplashes and aprons
    - c. Wet wall cladding panels
    - d. Adhesives and Sealants
- B. Related Work Specified Elsewhere:
  - 1. SECTION 06 10 00: Rough Carpentry
  - 2. SECTION 22 00 00: Plumbing

**1.02 DEFINITION**

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

**1.03 SUBMITTALS**

- A. Product Data:
  - 1. For each type of product indicated: Indicate product description, fabrication information and compliance with specified performance requirements.
  - 2. Product data for the following:
    - a. Mold resistance
- B. Shop Drawings: Submit shop drawings indicating location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
  - 1. Show full-size details, edge details, thermoforming requirements, attachments, etc.
  - 2. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement
  - 3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacles and other items installed in solid surface.
- C. Submit the following Samples:

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1. For each type of product specified.
  - a. Submit minimum 6-inch by 6-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.

**1.04 QUALITY ASSURANCE**

- A. Fabricators Qualifications: 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 for a minimum of three years and is certified in writing by the manufacturer.
- B. Installer Qualifications: Minimum of three years documented installation experience for projects similar in scope and complexity to the Project, and currently certified by the manufacturer as an acceptable installer.
- 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 other testing and inspecting agency acceptable to authorities having jurisdiction:
      - 1) Flame Spread Index: 25 or less
      - 2) Smoke Developed Index: 450 or less

**1.05 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.

**1.06 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Verify actual measurements and openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

**1.07 WARRANTY**

- A. Provide manufacturer's warranty against defects in materials.
  - 1. Warranty shall provide material and labor to repair or replace defective materials.
- B. Installed Warranty:
  - 1. Fabrication and installation must be performed by a manufacturer's certified Fabrication/Installation source.
  - 2. This warranty shall cover all fabrication and installation performed by the certified/approved source subject to the specific wording contained in the Installed Warranty Card.
- C. Manufacturer's warranty period: Ten years from the date of substantial completion.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. Subject to compliance with requirements, provide products by one of the following:
  - 1. Corian surfaces from DuPont company (basis of design)
  - 2. Avonite Surfaces
  - 3. Wilsonart
  - 4. Formica Corporation
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

**2.02 SOLID POLYMER COMPONENTS**

- A. 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.
- B. Superficial damage to a depth of 0.010 inch shall be repairable by sanding and/or polishing.
- C. Thickness: 1/2 inch at counters and 1/4 inch at wall panels
- D. Edge treatment: As indicated on drawings

**2.03 INTEGRAL SINKS**

- A. Composition: 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.
- B. Product Selections: As follows; specified dimensions as inside bowl dimensions:



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1. Model number: 810 ADA-Compliant; 16-1/2 inches long by 13-1/8 inches wide by 5-3/8 inches deep.
2. Color: As selected by Owner from manufacturer's full range.
3. Mounting: Seamed undermount

**2.04 BACK AND SIDE SPLASHES**

- A. Backsplash: Applied
- B. Sidesplash: Applied

**2.05 PERFORMANCE CHARACTERISTICS**

- A. Tensile Strength: 6,000 psi; ASTM D 638
- B. Tensile Modulus:  $1.5 \times 10^{-6}$  psi; ASTM D638
- C. Tensile Elongation: 0.4% minimum; ASTM D 638
- D. Flexural Strength: 10,000 psi; ASTM D 790
- E. Flexural Modulus:  $1.2 \times 10^{-6}$  psi; ASTM D 790
- F. Hardness: 56; Barcol Impressor, ASTM D 2583
- G. Thermal Expansion:  $1.80 \times 10^{-5}$  in./in. F; ASTM D 696
- H. Light Resistance: (Xenon Arc) No effect; NEMA LD 3-2000 Method 3.3
- I. Wear and Cleanability: Passes; ANSI Z124.3 & Z124.6
- J. Stain Resistance: Passes; ANSI Z124.3 & Z124.6
- K. Fungus and Bacteria Resistance: Does not support microbial growth; ASTM G21 & G22
- L. Boiling Water Resistance: No visible change; NEMA LD 3-2000 Method 3.5
- M. High Temperature Resistance: No chabge; NEMA LD 3-2000 Method 3.6
- N. Izod Impact: 0.26 ft.-lbs./in. of notch; ASTM D256 (Method A)
- O. Ball Impact Resistance: No fracture-1/2 lb. ball: ¼ inch slab-36 inch drop, ½ inch slab-144 inch drop; NEMA LD 3-2000 Method 3.8
- P. Weatherability: Delta E\*<sub>94</sub><5 in 1,000 hrs.; ASTM G 155
- Q. Specific Gravity: 1.7
- R. Moisture Absorption: Less than 0.25 percent; ASTM D 570, long term
- S. Toxicity: 99 (solid colors), 66 (patterned colors); Pittsburgh Protocol Test ("LC50" Test)
- T. Flammability: Class I and Class A; ASTM E 84, NFPA 255 & UL 723
- U. Flame Spread Index: <25
- V. Smoke Developed Index: <25

**2.06 ACCESSORIES**

- A. Joint Adhesive: Manufacturer's standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.
- B. Sealant: Manufacturer's standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone – any type), UL-listed silicone sealant in colors matching components.
- C. Sink/Lavatory mounting hardware: Manufacturer's standard bowl clips, panel inserts and fasteners for attachment of undermount sinks/lavatories.

**2.07 FACTORY FABRICATION**

A. Shop assembly

1. Fabricate components to the 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 inches wide.
3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
4. Route and finish component edges with clean, sharp returns.
  - a. Route cutouts, radii and contours to template.
  - b. Smooth edges
  - c. Repair or reject defective and inaccurate work.

**2.08 FINISHES**

- A. Color: As selected by Owner from manufacturer's "full" color chart.
- B. Finish: Provide surfaces with a uniform finish: Matte; gloss range of 5-20

**PART 3 – EXECUTION**

**3.01 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.

**3.02 COUNTERTOP 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 joint 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. Route 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 sag, bow or other variation from a straight line.
- B. Applied backsplashes and applied sidesplashes:
1. Install applied backsplashes using manufacturer's standard color-matched silicone sealant.
  2. Adhere applied sidesplashes to countertops using manufacturer's standard color-matched silicone sealant.
- C. Integral sinks/vanities:
1. Provide solid surface materials bowls and/or lavatories sinks with overflows in locations shown on the drawings.
  2. Secure sinks and lavatory bowls to tops using manufacturer's recommended sealant, adhesive and mounting hardware to maintain warranty.

### **3.03 WET WALL CLADDING PANELS INSTALLATION**

- A. Install wall cladding panels plumb, level, and true according to approved shop drawings and manufacturer's published installation instructions. Shim as required during installation process. Use woodworking and specialized fabrication tools acceptable to manufacturer.
- B. Route all wall cladding panels to size; sawcuts are not permissible. Cutouts must also be routed with eased edges.
- C. Provide eased panel edges where specified silicone sealant is required to fill gap between panels.
- D. Attach wall cladding panels to substrate with specified construction adhesive. Apply silicone adhesive as 1/8-inch beads in locations and spacing according to manufacturer's published installation instructions. Provide temporary bracing until adhesive has to set to proper strength. Promptly remove excess adhesive.
- E. Form wall cladding joint seams for multiple panels with specified seam adhesive. Seams in locations shown on approved shop drawings and acceptable to manufacturer. Promptly remove excess adhesive. Joints shall be installed as follows:
1. Panel to Panel Joints: Adhesive tongue and groove hard seam
  2. Outside Corners: Silicone seam
  3. Inside Corners: 2 1/2-inch baffle with silicone filled corner
  4. Wall to Floor: As detailed on construction documents
  5. Wall to Ceiling: Silicone filled

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- F. Provide specified silicone sealant to fill gaps in the following locations and as required by manufacturer:
1. Wall panel joints indicated to receive silicone sealant.
  2. At inside corners.
  3. At interface with tub or shower pan.
  4. At interface with tiled shower base.
  5. Between finished floor and ceiling for full height cladding.
  6. Not greater than 12 feet on center for any wall cladding length or height.
- G. Wall-mounted accessories must be completely supported by substrate wall framing, not wall cladding panels.
- H. Install solid surfacing moldings with specified silicone adhesive. Promptly remove excess adhesive.

**3.04 PROTECTION**

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

**END OF SOLID SURFACING FABRICATIONS**

**SECTION 06 64 00**

**PLASTIC PANELING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Plastic Paneling as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Glass-fiber reinforced plastic (FRP) wall paneling
    - b. Accessories and trim
- B. Related Work Specified Elsewhere:
  - 1. SECTION 06 10 00: Rough Carpentry
  - 2. SECTION 06 20 00: Finish Carpentry
  - 3. SECTION 07 92 00: Joint Sealants

**1.02 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Submit shop drawings of each wall showing locations of paneling and trim members with respect to all discontinuities in the wall elevation.
- C. Selection Samples: Submit manufacturer's standard color pattern selection samples representing manufacturer's full range of available colors and patterns.
- D. Samples for Verification: For plastic paneling and trim accessories, in manufacturer's standard sizes.

**1.03 QUALITY ASSURANCE**

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: 200 or less.
  - 2. Smoke-Developed Index: 450 or less.
  - 3. Testing Agency: Acceptable to authorities having jurisdiction.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

- B. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

**1.05 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.06 WARRANTY**

- A. Furnish one year guarantee against defects in material and workmanship.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products by Marlite which is located at: 1 Marlite drive, Dover, OH 44622, or comparable products by Fibertech, Fiberglass Specialties, Inc. or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

**2.02 PLASTIC SHEET PANELING**

- A. General: Gelcoat-finished, glass-fiber reinforced plastic panels complying with ASTM D 5319.
  - 1. Basis of Design Product: Standard FRP
  - 2. Nominal Thickness: Not less than 2.3mm (0.090 inches).
  - 3. Surface Texture: As selected by Architect from manufacturer's full range.
  - 4. Color: As selected by Architect from manufacturer's full range.

**2.03 ACCESSORIES**

- A. Trim Accessories: Manufacturer's standard narrow one-piece extrusions designed to retain and cover edges of panels.
  - 1. Material: Vinyl
  - 2. Color: As selected by Architect from manufacturer's full range.
  - 3. Trim Schedule:
    - a. Top Edges, Bottom Edges, & Vertical Edges: Marlite M370
    - b. Inside Corners: Marlite M350
    - c. Outside Corners: Marlite M360
    - d. Vertical and Horizontal Joints: Sealant Joint
    - e. Corner Guards: Marlite F560SS Stainless Steel

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- B. Exposed Fasteners: Not Permitted
- C. Adhesive: As recommended by plastic paneling manufacturer.
  - 1. Adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Sealant: Single-component, mildew-resistant, neutral curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements of Section 07 92 00 "Joint Sealants."
- E. Base: Color and profile as selected by Architect from manufacturer's full range.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

- A. Examine substrates and conditions, with Installer Present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

- A. Remove wallpaper, vinyl wall covering, loose or soluble paint, and other materials that might interfere with adhesive bond.
- B. Prepare substrate by sanding high spots and filling low spots as needed to provide flat, even surface for panel installation.
- C. Clean substrates of substances that could impair bond of adhesive, including oil, grease, dirt, and dust.
- D. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.
- E. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels.
  - 1. Mark plumb lines on substrate at panel joint locations for accurate installation.
  - 2. Locate trim accessories to allow clearance at panel edges according to manufacturer's written instruction.

**3.03 INSTALLATION**

- A. Install plastic paneling according to manufacturer's written instructions.
- B. Install panels in a full spread of adhesive. Drive rivets and exposed fasteners are not permitted.

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- C. Install trim accessories with adhesive and nails or staples. Do not fasten through panels.
- D. Fill grooves in trim accessories with sealant before installing and bed inside corner trim in a bead of sealant.
- E. Maintain uniform space between panels and wall fixtures. Fill space with sealant.
- F. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.
- G. Remove excess sealant and smears as paneling is installed. Clean with a solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

**END OF PLASTIC PANELING**



**SECTION 07 25 00**

**WEATHER BARRIERS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Weather Barriers as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Weather barrier membranes
    - b. Seam tape
    - c. Flexible flashing
    - d. Fasteners
- B. Related Work Specified Elsewhere:
  - 1. SECTION 06 10 00: Rough Carpentry
  - 2. SECTION 07 46 23: Wood Siding

**1.02 ACTION SUBMITTALS**

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used, including:
  - 1. Preparation instructions and recommendations
  - 2. Storage and handling requirements and recommendations
  - 3. Installation methods
  - 4. Design data and test reports
- B. Submit the following Samples:
  - 1. Weather Barrier Membrane, minimum 8-1/2 inches by 11-inches.

**1.03 QUALITY ASSURANCE**

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

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- B. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store weather barrier materials as recommended by weather barrier manufacturer.

**1.05 SCHEDULING**

- A. Review requirements for sequencing of installation of weather barrier assembly with installation of windows, doors, louvers and flashings to provide a weather-tight barrier assembly.
- B. Schedule installation of weather barrier materials and exterior cladding within nine months of weather barrier assembly installation.

**1.06 WARRANTY**

- A. Provide manufacturer's warranties:
  - 1. Weather barrier manufacturer's warranty for weather barrier for a period of ten (10) years from date of substantial completion.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products from DuPont which is located at: Chestnut Run Plaza 728, Wilmington, DE 19805, or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

**2.02 WEATHER BARRIER**

- A. Basis of Design: spunbonded polyolefin, non-woven, non-perforated, Weather Barrier is based upon DuPont Tyvek CommercialWrap **D** and related assembly components.
- B. Performance Characteristics:
  - 1. Air Penetration: 0.001 cfm/sf at 75 Pa when tested in accordance with ASTM E 2178. Type 1 when tested in accordance with ASTM E 1677.  $\leq 0.04$  cfm/ft @ 75 Pa when tested in accordance with ASTM E 2357.
  - 2. Water Vapor Transmission: 30 perms, when tested in accordance with ASTM E 96, Method B.
  - 3. Water Penetration Resistance: 235 cm when tested in accordance with AATCC Test Method 127
  - 4. Basis Weight: 2.4 oz/square yard, when tested in accordance with TAPPI Test Method T-410.
  - 5. Air Infiltration Resistance: Air infiltration at >750 seconds, when tested in accordance with TAPPI Test Method T-460
  - 6. Tensile Strength: 33/41 lbs/in., when tested in accordance with ASTM D 822, Method A

7. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E 84.  
Flame Spread: 15, Smoke Developed: 25

## **2.03 ACCESSORIES**

- A. Seam Tape: Pressure-sensitive plastic tape recommended by weather barrier manufacturer for sealing joints and penetrations in weather barrier.
- B. Fasteners:
  1. Wood Frame Construction: Weather Barrier manufacturer's Caps; #4 nails with large 1 inch plastic cap fasteners or 1 inch minimum plastic cap staple with leg length sufficient to achieve a minimum penetration of 5/8 inch into the wood stud.
- C. Sealants: Provide sealants that comply with ASTM C 920, elastomeric polymer sealant to maintain watertight conditions, as recommended by weather barrier manufacturer.
- D. Flexible Flashing
  1. Flexible membrane flashing materials for window openings and penetrations as manufactured by weather barrier manufacturer.
  2. Straight flashing membrane materials for flashing windows and doors and sealing penetrations such as masonry ties, etc. as manufactured by weather barrier manufacturer.
  3. Dual-sided flashing membrane materials for brick mold and non-flanged windows and doors as manufactured by weather barrier manufacturer.
  4. Thru-Wall flashing membrane materials for flashing at changes in direction or elevation (shelf angles, foundations, etc.) and at transitions between different assembly materials.
  5. Preformed three-dimensional shapes to complete the flashing system used in conjunction with Thru-Wall flashing.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer's recommended tolerances prior to installation of weather barrier and accessories.

### **3.02 INSTALLATION**

- A. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations
- B. Install weather barrier prior to installation of windows and doors.
- C. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap.

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- D. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level
- E. Sill Plate Interface: Extend lower edge of weather barrier over sill plate interface 3-6 inches. Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer.
- F. Window and Door Openings: Extend weather barrier completely over openings.
- G. Overlap weather barrier
  - 1. Exterior corners: minimum 12-inches
  - 2. Seams: minimum 6-inches
- H. Weather Barrier Attachment:
  - 1. Wood Frame Construction: Attach weather barrier to studs through exterior sheathing. Secure using weather barrier manufacturer recommended fasteners, space 6 -18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally.

**3.03 SEAMING**

- A. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
- B. Seal any tears or cuts as recommended by weather barrier manufacturer.

**3.04 FLASHING – FLANGED WINDOWS**

- A. Cut 9-inch wide flexible flashing a minimum of 12 inches longer than width of sill rough opening.
- B. Cover horizontal sill by aligning flexible flashing edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
- C. Fan flexible flashing at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges.
- D. On exterior, apply continuous bead of sealant to wall or backside of window mounting flange across jambs and head. Do not apply sealant across sill.
- E. Install window according to manufacturer's instructions.
- F. Apply 4-inch wide strips of straight flashing at jambs overlapping entire mounting flange. Extend jamb flashing 1-inch above top of rough opening and below bottom edge of sill flashing.
- G. Apply 4-inch wide strip of straight flashing at head flashing overlapping the mounting flange. Head flashing should extend beyond outside edges of both jamb flashings.

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- H. Position weather barrier head flap across head flashing. Adhere using 4-inch wide straight flashing over the 45-degree seams.
- I. Tape head flap in accordance with manufacturer recommendations
- J. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C 1193.

**3.05 PROTECTION**

- A. Protect installed weather barrier from damage.

**END OF WEATHER BARRIERS**

**SECTION 07 31 13**

**ASPHALT SHINGLES**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Asphalt Shingles as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Asphalt Shingles
    - b. Underlayment
- B. Related Work Specified Elsewhere:
  - 1. SECTION 06 10 00: Rough Carpentry
  - 2. SECTION 07 62 00: Sheet Metal Flashing and Trim

**1.02 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of asphalt shingle ridge and hip cap shingles, ridge vent and exposed valley lining indicated.
  - 1. Include similar Samples of trim and accessories involving color selection.
- C. Qualification Data: For qualified Installer
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.
- E. Research/Evaluation Reports: For each type of asphalt shingle required, from the ICC.
- F. Warranties: Sample of special warranties
- G. Maintenance Data: For each type of asphalt shingle to include in maintenance manuals.

**1.03 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Asphalt Shingles: 100 square feet of each type, in unbroken bundles.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.
- C. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

**1.06 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Environmental Limitations: Do not deliver or install asphalt shingles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

**1.07 WARRANTY**

- A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following
- a. Manufacturing defects
- b. Structural failures including failure of asphalt shingles to self-seal after a reasonable time.
2. Material Warranty Period: 50 years from date of Substantial Completion, prorated, with first 12 years non-prorated.
3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 110 mph for 10 years from date of Substantial Completion.
4. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.
5. Workmanship Warranty Period: 10 years from date of Substantial Completions

- B. Special Project Warranty: Roofing Installer's Warranty, or warranty form at end of this Section, signed by roofing installer, covering the Work of this Section, in which roofing Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products manufactured by CertainTeed Corporation which is located at: P.O. Box 860, Valley Forge, PA 19482, or comparable products by GAF Materials Corporation, Owens Corning or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

### **2.02 GLASS-FIBER-REINFORCED ASPHALT SHINGLES**

- A. Laminated-Strip Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced and self-sealing.
1. Basis of Design Product: Subject to compliance with requirements, provide CertainTeed Landmark Premium.
2. Butt Edge: Notched cut
3. Strip Size: Manufacturer's standard
4. Algae Resistance: Granules treated to resist algae discoloration
5. Color and Blends: As selected by Owner from manufacturer's full range
- B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles or site-fabricated units cut from asphalt shingle strips. Trim each side of lapped portion of unit to taper approximately 1-inch.

### **2.03 UNDERLAYMENT MATERIALS**

- A. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40-mil-thick, slip resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied.
1. Basis of Design Product: Subject to compliance with requirements, provide Grace, W.R. & Co., Ice-and-Water Shield or comparable product by one of the following:
- a. Carlisle Coatings & Waterproofing, Inc.
- b. Henry Company
- c. Johns Manville
- d. Owens Corning
- e. Polyguard Products, Inc.
- f. Protecto Wrap Company



- B. Felt: ASTM D 226/D 226 M, asphalt saturated organic felts, non-perforated.

#### **2.04 ACCESSORIES**

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle mails, minimum 0.120-inch diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch diameter flat head and of sufficient length to penetrate 3/4-inch into solid wood decking or extend at least 1/8-inch through OSB or plywood sheathing.
  - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch minimum diameter.

#### **2.05 METAL FLASHING AND TRIM**

- A. General: Comply with requirements of Section 07 62 00 "Sheet Metal Flashing and Trim".
  - 1. Sheet Metal: Anodized aluminum
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.
  - 1. Drip Edges: Fabricate in lengths not exceeding 10 feet with 2-inch roof-deck flange and 1-1/2 inch fascia flange with 3/8-inch drip at lower edge.
- C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16-inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least 4-inches from pipe onto roof.

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
  - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.

- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 UNDERLAYMENT INSTALLATION**

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Single-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2-inches over underlying course. Lap ends a minimum of 4-inches. Stagger end laps between succeeding courses at least 72-inches. Fasten with felt-underlayment nails.
  - 1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3-inches in direction that sheds water. Lap ends of felt not less than 6-inches over self-adhering sheet underlayment.
  - 2. Install fasteners at no more than 36-inches on center.
- C. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated on Drawings, lapped in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24-inches between courses. Roll laps with roller. Cover underlayment within seven days.

### **3.03 METAL FLASHING INSTALLATION**

- A. General: Install metal flashings and other sheet metals to comply with requirements in Section 07 62 00 "Sheet Metal Flashing and trim".
  - 1. Install metal flashings according to ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck
- C. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.
- D. Pipe Flashings: Form flashings around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

### **3.04 ASPHALT SHINGLE INSTALLATION**

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

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- B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed with self-sealing strip face up at roof edge.
  - 1. Extend asphalt shingles 1/2-inch over fascia at eaves and rakes.
  - 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Fasten asphalt shingle strips with a minimum of six roofing nails located according to manufacturer's written instructions.
  - 1. When ambient temperature during installation is below 50 degrees F, seal asphalt shingles with asphalt roofing cement spots.
- E. Woven Valleys: Extend succeeding asphalt-shingle courses from both sides of valley 12-inches beyond center of valley, weaving intersecting shingle-strip courses over each other. Use one-piece shingle strips without joints in valley.
  - 1. Do not nail asphalt shingles within 6-inches of valley center.
- F. Ridge Vent: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
- G. Hip and Ridge Shingle: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
  - 1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow

**3.05 ROOFING INSTALLER'S WARRANTY**

- A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following Project:
  - 1. Owner: <Insert name of Owner>
  - 2. Address: <Insert address>
  - 3. Building Name/Type: <Insert information>
  - 4. Address: <Insert address>
  - 5. Area of Work: <Insert information>
  - 6. Acceptance Date: <Insert date>
  - 7. Warranty Period: <Insert date>
  - 8. Expiration Date: <Insert date>
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

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- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he shall, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a weathertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
    - a. Lightning;
    - b. Peak gust wind speed exceeding 110 mph;
    - c. Fire;
    - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    - e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    - f. Vapor condensation on bottom of roofing; and
    - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
  2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
  4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of such alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified the Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
  5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
  6. Owner shall promptly notify Roofing installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of leaks, defects, or deterioration.
  7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work

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according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed the **<Insert day>** day of **<Insert month>**, **<Insert year>**.

1. Authorized Signature: **<Insert signature>**
2. Name: **<Insert name>**
3. Title: **<Insert title>**

**END OF ASPHALT SHINGLES**

**SECTION 07 46 23**

**WOOD SIDING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Wood Siding as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Wood shingle siding
    - b. Rainscreens for use in Sidewall Construction
- B. Related Work Specified Elsewhere:
  - 1. SECTION 06 10 00: Rough Carpentry
  - 2. SECTION 06 20 00: Finish Carpentry
  - 3. SECTION 07 25 00: Weather Barriers
  - 4. SECTION 09 93 00: Staining and Transparent Finishing

**1.02 SUBMITTALS**

- A. Product Data: For each type of product specified.
- B. Submit the following Samples:
  - 1. For each exposed product and for each color and finish specified, in sizes indicated
    - a. Wood Shingles: Full size unit

**1.03 MAINTENANCE MATERIALS 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. Wood Shingles: 100 sq. ft. of each type, color, and finish, in unbroken bundles.

**1.04 QUALITY ASSURANCE**

- A. Manufacturers Qualifications: Minimum 5 years' experience harvesting and milling forest products.
- B. Installer Qualifications: Minimum 2 years' experience installing similar products.
- C. Grading Agency Qualifications: An independent testing and inspecting agency recognized by authorities having jurisdiction as qualified to label siding for compliance with referenced grading rules.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Store siding in a dry, well-ventilated, weathertight location according to manufacturer's written instructions.

**1.06 PROJECT CONDITIONS**

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit siding installation and related work to be performed according to manufacturer's written instructions.
  - 1. Field-Finished Siding: Proceed with installation of siding only when existing and forecast weather conditions permit installation and the immediate application of at least one coat of specified finish on siding before it is exposed to rain, snow, or dampness.
    - a. Proceed with installation only after base or primer coat has been applied to every surface of siding units and has dried.

**1.07 WARRANTY**

- A. Special Materials Warranty: Manufacturer's warranty in which manufacturer agrees to repair or replace products that fail in materials within specified warranty period. Material failures include manufacturing defects that result in leaks.
  - 1. Materials Warranty Period: Limited lifetime from date of Substantial Completion

**PART 2 – PRODUCTS**

**2.01 SHINGLE SIDING**

- A. General: Cedar shingle siding
  - 1. Species: Western red cedar
  - 2. Grade: Clear "B" or better.
  - 3. Exposure: 4-inches to 5-inches exposed to weather
  - 4. Butt thickness: 3/8-inch
  - 5. Moisture: Kiln-dried to approximately 12%
  - 6. Edge: Square butt
  - 7. Width: Random
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

**2.02 ACCESSORIES**

- A. Flashing: Provide factory painted aluminum flashing complying with Section 07 62 00 "Sheet Metal Flashing and Trim" at window and door heads and where indicated.

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1. Finish for Aluminum Flashing: High-performance organic finish (Kynar pvf paint system), same color as siding Factory coating as approved by Owner.
- B. Fasteners:
1. For fastening aluminum flashings, use stainless steel or aluminum fasteners.
  2. For fastening cedar shingles use rust-resistant aluminum or stainless steel nails or hot-dip galvanized box nails.

**2.03 RAINSCREEN**

- A. Basis of Design: Products manufactured by Benjamin Obdyke Incorporated, which is located at: 400 Babylon Road, Suite A, Horsham, PA 19044, or approved equal.
1. Basis of Design Product: Slicker Classic
    - a. Description: Vertically-channeled three-dimensional matrix in roll form.
    - b. Material: Nylon (up to 10% post-industrial recycled content).
    - c. Thickness: 0.25-inches
    - d. Matrix Design: 8 channels per 4-inches. Two channels per inch.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 INSTALLATION, GENERAL**

- A. Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Do not install damaged components.

**3.03 RAINSCREEN INSTALLATION**

- A. Install sidewall sheathing material over framing.
- B. Apply weather barrier in accordance with Section 07 25 00 "Weather Barriers."
- C. Apply trim around windows and doors or shim out other trim 1/4-inch to allow for thickness of rainscreen.
- D. Install rainscreen by butting against window and door trim.
1. Wherever siding or cladding will be applied, roll out rainscreen with channels running vertically. Cover entire wall surface wherever siding materials will be installed.



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2. Do not stretch rainscreen.
  3. Install rainscreen so that it lies flat against the wall.
  4. Butt edges of new rolls or new courses together. Do not overlap layers of rainscreen.
  5. Nail or staple rainscreen every 3 square feet.
- E. Install siding or cladding system over wall surface in compliance with manufacturer's installation instructions.
1. Install siding even with trim.
- F. To prevent insect infiltration along bottom edge of siding, attach a 6-inch wide piece of screen material (1/8-inch maximum hole size) continuously along the wall, 3-inches above bottom edge of rainscreen. Fold up onto outer surface of installed rainscreen and fasten with a large head nail to hold in place prior to applying siding or cladding.

**3.04 WOOD SHINGLE SIDING INSTALLATION**

- A. Install products according to manufacturer's written instructions and recommendations in CSSB's "Exterior and Interior Wall Manual."
- B. Install products, beginning at base of wall.
- C. Starter Undercourse: Install a single course of undercoursing at the base of the wall in a continuous straight line.
1. Extend 1-1/2 inches below top of foundation wall.
  2. Match fastening and corner treatment of siding.
- D. Exposed Siding:
1. Install starter (first) course of exposed siding over starter undercourse with butts 1/2-inch lower than undercourse butts.
  2. Offset joints in first course of exposed siding a minimum of 1-1/2 inches from joints in starter undercourse.
  3. Install succeeding exposed siding courses with joints offset a minimum of 1-1/2 inches from joints in the two courses below.
  4. Install exposed siding courses with butt lines to match into existing.
  5. Fasten each unit with two concealed nails spaced 3/4 to 1-inch from edges and 1-inch above butt line of succeeding course. For units wider than 10-inches, add two concealed fasteners, spaced 1-inch apart, to the center of the unit. Drive fasteners flush with top surface of units without crushing wood.
  6. Interior Corner Treatment: Butt to interior corner trim.
  7. Exterior Corner Treatment: Butt to corner boards with flashing behind.

**3.05 ADJUSTING AND CLEANING**

- A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

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- B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

**END OF WOOD SIDING**

**SECTION 07 62 00**

**SHEET METAL FLASHING AND TRIM**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Sheet Metal Flashing and Trim as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Formed roof sheet metal fabrications.
    - b. Formed wall sheet metal fabrications.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 07 31 13: Asphalt Shingles
  - 2. SECTION 07 92 00: Joint Sealants

**1.02 PERFORMANCE REQUIREMENTS**

- A. General Performance: Installed sheet metal shall withstand uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Sheet metal units shall remain watertight.
- B. Material Compatibility: Provide sheet metal materials that are compatible with one another under conditions of service and application required, as demonstrated by the sheet metal manufacturer based on testing and field experience.
- C. Comply with governing codes and regulations.
- D. Reference Standards: Applicable portions of SMACNA, ANSI/SPRI ES-1, ASTM and NAAMM publications.

**1.03 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
  - 1. Submit the following: Include details for forming, joining, supporting, and securing sheet metal flashing and trim, including pattern of seams, termination points, fixed points, expansion joints, expansion-joint covers, edge conditions, special conditions, and connections to adjoining work.

- a. Coping and drip edge at roof edges.
- b. Through-wall flashing pans.
- c. Penetration flashing (including rain hoods)

C. Warranty: Sample of special warranty.

D. Maintenance data.

#### **1.04 QUALITY ASSURANCE**

- A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.
- B. Fabricator Qualifications: Show that employees are skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance. Minimum experience shall be 10 years.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Stack material to prevent twisting, bending and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials causing discoloration or staining.

#### **1.06 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

#### **1.07 WARRANTY**

- A. Manufacturer's Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes for 20 years from date of Substantial Completion.
- B. Installer's Warranty: Submit sheet metal Installer's warranty, signed by Installer, covering the Work of this Section, including all components of sheet metal system for five years from date of Substantial Completion. Warranty shall include all materials, labor, tools and equipment necessary for repair, restoration, or replacement of all new work damaged as a result of defects, imperfections, or faults in Materials and Workmanship.

### **PART 2 – PRODUCTS**

#### **2.01 SHEET METAL FLASHING AND TRIM**

- A. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.
  - 1. Two Coat Fluoropolymer Finish: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat.
  - 2. Color: As selected by Architect from manufacturer's full range.
- B. Stainless-Steel Sheet: ASTM A 240/A 240 M or ASTM A 666, Type 304, dead soft, fully annealed.

## **2.02 MISCELLANEOUS MATERIALS**

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory applied coating.
    - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
    - c. Spikes and Ferrules: Same material as gutter; with spike and ferrule matching internal gutter width.
  - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
  - 3. Fasteners for Stainless-Steel: Series 300 stainless steel.
- C. Solder:
  - 1. For Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic nonsag, nontoxic, nonstaining tape 1/2-inch wide and 1/8 inch thick.
- E. Elastomeric Sealant: ASTM C920, elastomeric polymer sealant; low modulus; of type, grade, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

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- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

**2.03 FABRICATION, GENERAL**

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" and ANSI/SPRI ES-1 that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extend possible.
  - 1. Obtain field measurements for accurate fit before shop fabrication.
  - 2. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
  - 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.
- C. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1-inch deep, filled with butyl sealant concealed within joints.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- G. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.

**2.04 ROOF SHEET METAL FABRICATIONS**

- A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
  - 1. Aluminum: 0.032-inch thick.
- B. Drip Edges: Fabricate from the following materials:

1. Aluminum: 0.032-inch thick.
- C. Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:
1. Aluminum: 0.032-inch thick.

## **2.05 WALL SHEET METAL FABRICATIONS**

- A. Opening Flashing in Frame Construction: Fabricate head, sill, jamb and similar flashings to extend to the sealant line of wall openings. Form head and sill flashings with 2-inch-high, end dams. Fabricate from the following materials:
1. Type 316 Stainless Steel: 24 gauge.

## **PART 3 – EXECUTION**

### **3.01 UNDERLAYMENT INSTALLATION**

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Comply with temperature restriction of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6-inches staggered 24-inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

### **3.02 INSTALLATION, GENERAL**

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement so that completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  3. Space cleats not more than 12-inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
  4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
  5. Install sealant tape where indicated.
  6. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

1. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24-inches of corner intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1-inch deep, filled with sealant concealed within joints.
- D. Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4-inch for wood screws and for metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal joints as shown and as required for watertight construction.
- F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.
  1. Do not solder aluminum sheet.
  2. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
  3. Stainless-Steel Soldering: Tin edges of uncoated sheets using solder recommended for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
  4. Copper Soldering: Tin edges of uncoated copper sheets using solder for copper.
- G. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

### **3.03 ROOF FLASHING INSTALLATION**

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
- C. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4-inches over base flashing. Install stainless-steel draw band and tighten.



- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

**3.04 WALL FLASHING INSTALLATION**

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend to the required sealant line of wall openings.

**3.05 CLEANING AND PROTECTION**

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

**END OF SHEET METAL FLASHING AND TRIM**

**SECTION 07 92 00**

**JOINT SEALANTS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Joint Sealants as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Silicone joint sealants.
    - b. Urethane joint sealants.
    - c. Latex joint sealants.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 07 46 23: Wood Siding

**1.02 SUBMITTALS**

- A. Product Data: For each joint-sealant product specified, including: Preparation instructions and recommendations
- B. Samples for Initial Selection: Manufacturer's color charts consisting of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch wide joints formed between two 6-inch long strips of material matching the appearance of exposed surfaces adjacent to joints sealants.
- D. Joint Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation
  - 4. Joint-sealant color.
- E. Qualification Data: For qualified Installer and testing agency.
- F. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

**1.03 QUALITY ASSURANCE**

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- A. Source Limitations: Obtain each kind of joint sealant from a single source from single manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
  - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
  - 2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
- C. Installer Qualifications: Experience Installer equipped and trained for application of joint sealants required for this Project with record of successful completion of projects of similar scope.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

**1.05 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not proceed with installation of joint sealants under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 degrees F.
  - 2. When joint substrates are wet.
  - 3. Where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
  - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

**1.06 WARRANTY**

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: 7 to 10 years from date of Substantial Completion.

- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
  2. Disintegration of joint substrates from natural causes exceeding design specifications.
  3. Mechanical damage caused by individuals, tools or other outside agents.
  4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis of Design: Provide joint sealant products manufactured by Tremco, Inc., Commercial Sealants and Waterproofing Division, An RPM Company which is located in: Beachwood, OH, or comparable products by Dow Corning Corporation, Sika Corporation, Pecora Corporation, or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

### **2.02 MATERIALS, GENERAL**

- A. VOC Content for Interior Applications: Provide sealants and sealant primers complying with the following VOC content limits per 40 CFR 59, Subpart D (EPA Method 24):
1. Architectural Sealants: 250 g/L.
  2. Sealant Primers for Nonporous Substrates: 250 g/L.
  3. Sealant Primers for Porous Substrates: 775 g/L.
- B. Low-Emitting Sealants for Interior Applications: Provide sealants and sealant primers complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Compatibility: Provide joint sealants and accessory materials that are compatible with one another, and with adjacent materials, as demonstrated by sealant manufacturer using ASTM C 1087 testing and related experience.
- D. Joint Sealant Standard: Comply with ASTM C 920 and other specified requirements for each sealant.
- E. Stain Test Characteristics: Where sealants are required to be non-staining, provide sealants tested per ASTM C 1248 as non-staining on porous joint substrates specified.

### **2.03 SILICONE JOINT SEALANTS**

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- A. Single-Component, Nonsag, Non-Staining, Neutral-Curing Silicone Joint Sealant **SJS #1**: ASTM C 920, Type S, Grade NS, Class 100/50, Use NT; SWRI validated.
1. Basis of Design Product: Spectrem 1 by Tremco
  2. Volatile Organic Compound Content: 1 g/L maximum
  3. Staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.
  4. Color: As selected by Owner from manufacturer's standard line of colors.
- B. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant **SJS #2**: ASTM C 920, Type S, Grade NS, Class 25, Use NT.
1. Basis of Design Product: Tremsil 200 Sanitray by Tremco
  2. Volatile Organic Compound Content: 1 g/L maximum
  3. Staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.
  4. Color: As selected by Owner from manufacturer's standard line of colors.

**2.04 URETHANE JOINT SEALANTS**

- A. Single-Component, Nonsag, Moisture-Cure, Polyurethane Joint Sealant **UJS #1**: ASTM C 920, Type S, Grade NS, Class 50, Use NT.
1. Basis of Design Product: Dymonic 100 Tremco
  2. Volatile Organic Compound (VOC) Content: 40 g/L maximum.
  3. Tensile Strength ASTM D412: 350 to 450 psi.
  4. Percent Elongation ASTM D412: 800 to 900%.
  5. Modulus at 100% ASTM D412: 75 to 85 psi.
  6. Tear Strength ASTM D412: 65 to 75 psi.
  7. Smoke Development ASTM E84: 5
  8. Color: As selected by Owner from manufacturer's standard line of colors.

**2.05 LATEX JOINT SEALANTS**

- A. Latex Joint Sealant **LJS #1**: Siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
1. Basis of Design Product: Tremflex 834 by Tremco
  2. Volatile Organic Compound (VOC) Content: 35 g/L maximum.
  3. Color: As selected by Owner from manufacturer's standard line of colors.

**2.06 SOLVENT-RELEASE-CURING JOINT SEALANTS**

- A. Butyl-Rubber-Based Joint Sealant **BJS #1**: ASTM C 1311.
1. Basis of Design Product: Tremco Butyl Sealant
  2. Volatile Organic Compound (VOC) Content: 250 g/L maximum.
  3. Color: As selected by Owner from manufacturer's standard line of colors.

**2.07 JOINT SEALANT ACCESSORIES**

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- A. Cylindrical Sealant Backing: ASTM C 1330, Type B non-absorbent, bi-cellular material with surface skin, or Type O open-cell polyurethane, as recommended by sealant manufacturer for application.
- B. Bond Breaker Tape: Polymer tape compatible with joint sealant and adjacent materials and recommended by sealant manufacturer.
- C. Joint Substrate Primers: Substrate primer recommended by sealant manufacturer for application.
- D. Cleaners: Chemical cleaners acceptable to joint sealant manufacturer.
- E. Masking Tape: Non-Staining, non-absorbent tape product compatible with joint sealants and adjacent surfaces.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

- A. Examine joint profiles and surfaces to determine if work is ready to receive joint sealants. Verify joint dimensions are adequate for development of sealant movement capability. Verify joint surfaces are clean, dry, and adequately cured. Proceed with joint sealant work once conditions meet sealant manufacturer's written recommendations.

**3.02 PREPARATION**

- A. Joint Surface Cleaning: Clean joints prior to installing joint sealants using materials and methods recommended by sealant manufacturer. Comply with ASTM C 1193.
  - 1. Remove curing compounds, laitance, form-release agents, dust, and other contaminants.
  - 2. Clean nonporous and porous surfaces utilizing chemical cleaners acceptable to sealant manufacturer.
  - 3. Protect elements surrounding the Work of this section from damage or disfiguration. Apply masking tape to adjacent surfaces when required to prevent damage to finishes from sealant installation.

**3.03 SEALANT APPLICATION**

- A. Sealant and Primer installation Standard: Comply with ASTM C 1193 and manufacturer's written instructions.
- B. Joint Backing: Select joint backing materials recommended by sealant manufacturer as compatible with sealant and adjacent materials. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.
  - 1. Install joint backing to maintain the following joint ratios:
    - a. Joints up to 1/2-inch wide: 1:1 width to depth ratio.
    - b. Joints greater than 1/2-inch wide: 2:1 width to depth ratio; maximum 1/2-inch joint depth.
  - 2. Install bond breaker tape over substrates when sealant backings are not used.

- C. Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.
- D. Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.
- E. Liquid Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths recommended for application. Apply in continuous operation from bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.
  - 1. Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.
  - 2. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
  - 3. Tool exposed joint surface concave using tooling agents provided by sealant manufacturer for application.
- F. Cleaning: remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.
  - 1. Remove masking tape immediately after tooling joint without disturbing seal.
  - 2. Remove excess sealant from surfaces while still uncured.

### **3.04 FIELD QUALITY CONTROL**

- A. Field-Adhesion Testing: Perform adhesion tests in accordance with manufacturer's instructions and with ASTM C 1193, Method A.
  - 1. Perform 5 tests for the first 1000-feet of joint length for each kind of sealant and joint substrate, and one test for each 1000-feet of joint length thereafter or 1 test per each floor per building elevation, minimum.
  - 2. For sealant applied between dissimilar materials, test both sides of joint.
- B. Remove sealants failing adhesion test, clean substrates, reapply sealants, and re-test. Test adjacent sealants to failed sealants.
- C. Submit report of field adhesion testing to Owner indicating tests, locations, dates, results, and remedial actions taken.

### **3.05 EXTERIOR JOINT-SEALANT SCHEDULE**

- A. Exterior concealed transition joints in air barrier: **UJS #1**
- B. Exterior concealed watertight joints in cladding system: **SJS #1**
- C. Exterior joints between different materials listed above: **SJS #1**
- D. Exterior perimeter joints at frames of doors, windows, storefront frames, curtain wall frames, and louvers: **SJS #1**
- E. All other exterior non-traffic joints: **SJS #1**

**3.06    INTERIOR JOINT-SEALANT SCHEDULE**

- A.    Interior perimeter joints of interior frames: **LJS #1**
- B.    Interior sanitary joints between plumbing fixtures, food preparation fixtures, and casework and adjacent walls, floors and counters: **SJS #2**
- C.    Interior non-moving joints between interior painted surfaces and adjacent materials: **LJS #1**
- D.    Interior concealed sealants at thresholds and sills: **BJS #1**

**END OF JOINT SEALANTS**



**SECTION 08 16 00**

**COMPOSITE DOORS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Composite Doors as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. FRP doors
    - b. Fiberglass doors
    - c. Fiberglass door frames
- B. Related Work Specified Elsewhere:
  - 1. SECTION 08 71 00: Door Hardware

**1.02 SUBMITTALS**

- A. Product Data: Submit manufacturer's product data, including description of materials, components, fabrication, finishes, and installation.
- B. Shop Drawings: Submit shop drawings indicating elevations, sections, and details, indicating dimensions, tolerances, materials, fabrication, doors, panels, framing, hardware schedule, and finish.
- C. Submit the following Samples:
  - 1. Door: Submit manufacturer's sample of door showing face sheets, core, framing, and finish.
  - 2. Color: Submit manufacturer's samples of standard colors of doors and frames.
- D. Test Reports: Submit test reports from qualified independent testing agency indicating doors comply with performance requirements.
- E. Manufacturer's Project References: Submit list of successfully completed projects including project name and location, name of architect, and type and quantity of doors manufactured.
- F. Maintenance Manual: Submit manufacturer's maintenance and cleaning instructions for doors, including maintenance and operating instructions for hardware.
- G. Warranty: Submit manufacturer's standard warranty.

**1.03 QUALITY ASSURANCE**

A. Manufacturers Qualifications:

1. Continuously engaged in manufacturing doors of similar type to that specified, with a minimum of 25 years successful experience.
2. Door and frame components from same manufacturer.
3. Evidence of a compliant documented quality management system.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying opening door mark and manufacturer.
- C. Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
- D. Protect materials and finish from damage during handling and installation.

**1.05 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.06 WARRANTY**

- A. Warrant doors, frames, and factory hardware against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation, and deterioration of finish or construction in excess of normal weathering.
- B. Warranty Period: Ten years starting on date of shipment. In addition, a limited lifetime (while the door is in its specified application in its original installation) warranty covering: failure of corner joinery, core deterioration, delamination or bubbling of door skin.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of Design: Special-Lite, Inc. which is located at: P.O. Box 6, Decatur, MI 49045, or comparable products by CORRIM Company or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

**2.02 FRP DOORS**

- A. Basis of Design Product: SL-17 Flush Doors with SpecLite 3 fiberglass reinforced polyester (FRP) face sheets.

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B. Door Opening Size: As indicated on the Drawings.

C. Construction:

1. Door Thickness: 1 3/4-inches.
2. Stiles and Rails: Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-t6 alloy recovered from industrial processes, minimum of 2-5/16 inch depth.
3. Corners: Mitered.
4. Provide joinery of 3/8-inch diameter full-width tie rods through extruded splines top and bottom integral to standard tubular shaped stiles and rails reinforced to accept hardware as specified.
5. Securing Internal Door Extrusions: 3/16-inch angle blocks and locking hex nuts for joinery. Welds, glue, or other methods are not acceptable.
6. Furnish extruded stiles and rails with integral reglets to accept face sheets. Lock face sheets into place to permit flush appearance.
7. Rail caps or other face sheet capture methods are not acceptable.
8. Extrude top and bottom rail legs for interlocking continuous weather bar.
9. Meeting Stiles: Pile brush weatherseals. Extrude meeting stile to include integral pocket to accept pile brush weatherseals.
10. Bottom of Door: Install bottom weather bar with nylon brush weatherstripping into extruded interlocking edge of bottom rail.
11. Glue: Use of glue to bond sheet to core or extrusions is not acceptable.

D. Face Sheet:

1. Material: SpecLite3 FRP, 0.120-inch thickness, finish color throughout.
2. Protective coating: Abuse-resistant engineered surface. Provide FRP with SpecLite3 protective coating, or equal.
3. Texture: Pebble.
4. Color: As selected by Owner from manufacturer's full range.
5. Adhesion: The use of glue to bond face sheet to foam core is prohibited.

E. Core:

1. Material: Poured-in-place polyurethane foam.
2. Density: Minimum 5 pounds per cubic foot.
3. R-Value: Minimum of 9.
4. ASTM E84: Class A.

F. Cutouts:

1. Manufacture doors with cutouts for required vision lites, louvers, and panels.
2. Factory install vision lites, louvers, and panels.

G. Hardware:

1. Premachine doors in accordance with templates from specified hardware manufacturers and hardware schedule.

2. Factory install hardware.

## **2.03 FIBERGLASS DOORS**

- A. Basis of Design Product: AF-100 Pultruded FRP Door.
- B. Door Opening Size: As indicated on the Drawings.
- C. Construction:
  1. Door Thickness: 1 3/4-inches.
  2. Construction: Doors shall be FRP, pultruded as one monolithic panel, with integral stiles.
  3. Reinforcement: Solid FRP shapes to be chemically welded at factory. All structural members shall utilize a chemically resistant UV stabilized resin system.
  4. Stile Edge: Seamless 9/16" thick solid FRP.
  5. Top Rail: 6" pultruded tube profile designed to fit flush and be chemically welded inside the door.
  6. Bottom Rail: Pultruded FRP inverted U channel designed to fit flush and be chemically welded inside the door, allowing doors to be field trimmed. Closed bottom rail to be supplied as option.
- D. Face Sheet:
  1. Material: Pultruded FRP, 0.125-inch thickness, finish color throughout.
  2. Texture: Smooth
  3. Fiberglass Content: Minimum 47% by weight.
  4. Color: As selected by Owner from manufacturer's full range.
- E. Core:
  1. Material: Polyurethane foam.
  2. Density: Minimum 6 pounds per cubic foot.
  3. ASTM E84: Class B.
- F. Cutouts:
  1. Manufacture doors with cutouts for required vision lites, louvers, and panels.
  2. Factory install vision lites, louvers, and panels.
- G. Hardware:
  1. Premachine doors in accordance with templates from specified hardware manufacturers and hardware schedule.

## **2.04 MATERIALS**

- A. Aluminum Members:

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1. Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T6 alloy recovered from industrial processes: ASTM B 221.
  2. Sheet and Plate: ASTM B 209
  3. Alloy and Temper: As required by manufacturer for strength, corrosion resistance, application of required finish, and control of color.
- B. Components: Door and frame components from same manufacturer.
- C. Fasteners:
1. Material: Aluminum, 18-8 stainless steel, or other noncorrosive metal.
  2. Compatibility: Compatible with items to be fastened.
  3. Exposed Fasteners: Screws with finish matching items to be fastened.

**2.05 FABRICATION**

- A. Sizes and Profiles: Required sizes for door and frame units, and profile requirements shall be as indicated on Drawings.
- B. Coordination of Fabrication: Field measure before fabrication and show recorded measurements on shop drawings.
- C. Assembly:
1. Complete cutting, fitting, forming, drilling, and grinding of metal before assembly.
  2. Remove burrs from cut edges.
- D. Welding: Welding of doors or frames is not acceptable.
- E. Fit:
1. Maintain continuity of line and accurate relation of planes and angles.
  2. Secure attachments and support at mechanical joints with hairline fit at contacting members.

**2.06 FIBERGLASS FRAMES**

- A. Framing:
1. Size and Type: As indicated on the Drawings.
  2. Materials: 1/4" thick solid pultruded FRP profiles having no corrosive components or reinforcement.
  3. Width: 2" face.
  4. Depth: As required by wall construction.
  5. Assembly: Knock down (KD) for field assembly.
  6. Door Stop: 5/8" x 2 1/4".
  7. Corner Construction: Mitered with 4" x 4" x 3/8" pultruded FRP angle reinforcement with interlocking pultruded FRP brackets.
  8. Reinforcing: 1/4" pultruded FRP chemically welded at all hinge, strike and closer locations.

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9. Anchors: As suitable for types of construction.
10. Fasteners for reinforcing: 18-8 Stainless Steel.

**2.07 HARDWARE**

- A. Premachine doors in accordance with templates from specified hardware manufacturers and hardware schedule.
- B. Factory install hardware.
- C. Hardware Schedule: As specified in Section 08 71 00 "Door Hardware"
- D. Finish: As selected by Owner from manufacturer's full range.

**2.08 VISION LITES**

- A. Factory Glazing: 1-inch glass insulating units
- B. Lites in Exterior Doors: Allow for thermal expansion.
- C. Rectangular Lites:
  1. Size: As indicated on the Drawings.
  2. Factory glazed with screw-applied aluminum stops anodized to match perimeter door rails.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

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

**3.02 PREPARATION**

- A. Ensure openings to receive frames are plumb, level, square, and in tolerance.

**3.03 INSTALLATION**

- A. Install doors in accordance with manufacturer's instructions.
- B. Install doors plumb, level, square, true to line, and without warp or rack.
- C. Anchor frames securely in place.
- D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.

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- E. Set thresholds in bed of mastic and backseal.
- F. Install exterior doors to be weathertight in closed position.
- G. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- H. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

**3.04 ADJUSTING**

- A. Adjust doors, hinges, and locksets for smooth operation without binding.

**3.05 CLEANING**

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that would damage finish.

**3.06 PROTECTION**

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

**END OF COMPOSITE DOORS**

**SECTION 08 71 00**

**DOOR HARDWARE**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Door Hardware as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Mechanical door hardware
- B. Related Work Specified Elsewhere:
  - 1. SECTION 08 16 00: Composite Doors

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Other Action Submittals:
  - 1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
    - a. Submittal Sequence: Submit door hardware schedule concurrent with submission of product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
    - b. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
    - c. Content: Include the following information:
      - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
      - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
      - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
      - 4) Fastenings and other pertinent information.
      - 5) Explanation of abbreviations, symbols, and codes contained in schedule.
      - 6) Mounting locations for door hardware.
      - 7) List of related door devices specified in other Sections for each door and frame.



**1.03 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer and Architectural Hardware Consultant.
- B. Product Test Reports: For Compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.
- C. Warranty: Special warranty specified in this Section.

**1.04 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware schedule.

**1.05 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.
- B. Maintenance Tool and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, removal and replacement of door hardware.

**1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
- B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- C. Source Limitations: Obtain each type of door hardware from a single manufacturer.
- D. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.
  - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
  - 2. Comply with the following maximum opening-force requirements:
    - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
    - b. Sliding Doors: 5 lbf applied parallel to door at latch.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2-inch high.
4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from latch, measured to the leading edge of the door.

#### **1.07 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- C. 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.

#### **1.08 COORDINATION**

- A. 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.

#### **1.09 WARRANTY**

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

### **PART 2 – PRODUCTS**

#### **2.01 SCHEDULED DOOR HARDWARE**

- A. Provide door hardware for each door as scheduled on Drawings to comply with requirements in this Section.
  1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturer's products, unless otherwise noted.

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- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware as indicated in Part 2 Articles following. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Manufacturer and product designations are listed for each door hardware type required for the purpose of establishing minimum requirements.

**2.02 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products from Hager Companies which is located at: 139 Victor St., St. Louis, MO 63104 or comparable products by other manufacturers listed below.

- B. The following manufacturers are approved subject to compliance with requirements, for the product categories listed:

1. Hinges: Stanley, McKinney
2. Locks and Latches: Schlage, Yale, Sargent
3. Push/Pull Latches: Rockwood, Ives, Burns
4. Deadbolts: Schlage, Yale, Sargent
5. Cylinders: Schlage, Yale, Sargent
6. Push/Pull Plates and Bars: Rockwood, Ives, Burnes
7. Closers: LCN, Sargent, Dorma
8. Protective Trim: Rockwood, Burns
9. Stops and Holders: Rockwood, Ives
10. Gasketing and Weatherstripping: National Guard, Pemko
11. Thresholds: National Guard, Pemko
12. Silencers: Ives, Rockwood, Burns

**2.03 HINGES**

- A. Hinges, including electric hinges and self-closing hinges when scheduled, shall be of one manufacturer as listed for continuity of design and consideration of warranty and shall be certified and listed by the following:

1. Butts and Hinges: ANSI/BHMA A156.1
2. Template Hinge Dimensions: ANSI/BHMA A156.7

- B. Butt Hinges:

1. Hinge weight and size unless otherwise indicated in hardware sets:
  - a. Doors up to 36-inches wide and up to 1-3/4 inches thick provide hinges with a minimum thickness of 0.134-inch and a minimum of 4-1/2 inches in height.
  - b. Doors from 36-inches wide up to 42-inches wide and up to 1-3/4 inches thick provide hinges with a minimum thickness of 0.145-inch and a minimum of 4-1/2 inches in height.
  - c. Width of hinge is to be minimum required to clear surrounding trim.
2. Base material unless otherwise indicated in hardware sets:
  - a. Exterior Doors: 304 Stainless Steel.

- b. Interior Doors: Steel material.
  - c. Stainless Steel ball bearing hinges shall have stainless steel ball bearings. Steel ball bearings are unacceptable.
- 3. Quantity of hinges per door unless otherwise stated in hardware sets:
  - a. Doors 60-inches up to 90-inches in height provide 3 hinges.
- 4. Hinge design and options unless otherwise indicated in hardware sets:
  - a. Hinges are to be of a square corner five-knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
  - b. Out-swinging exterior and out-swinging access controlled doors shall have non-removable pins (NRP) to prevent removal of pin while door is in closed position.
  - c. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
  - d. When shims are necessary to correct frame or door irregularities, provide metal shims only.
- 5. Basis of Design Product: Hager BB1168/BB1199 heavy weight.

## **2.04 LOCKS AND LATCHES (CYLINDRICAL)**

- A. Locks and latches shall be of one manufacturer as listed for continuity of design and consideration of warranty. Product to be certified and listed by following:
  - 1. ANSI/BHMA A156.2 Series 4000 Certified to Grade 1.
  - 2. ANSI/BHMA A250.13 Certified for a minimum design load of 1150lbf for single out swinging doors measuring 36-inches in width and 84-inches in height and a minimum design load of 1150lbf for out swinging single doors measuring 48-inches in width and 84-inches in height.
  - 3. UL/cUL Labeled and listed for functions up to 3 hours for single doors up to 48-inches in width and up to 96-inches in height.
  - 4. UL10C/UBC 7-2 Positive Pressure Rated.
  - 5. ICC/ANDI A117.1.
- B. Lock and latch function numbers and descriptions of manufacturer's series as listed in hardware sets. Material and Design:
  - 1. Lock and Latch chassis to be Zinc dichromate for corrosion resistance.
  - 2. Keyed functions to be of a freewheeling design to help resist against vandalism.
  - 3. Non-handed, field reversible.
  - 4. Thru-bolt mounting with no exposed screws.
  - 5. Levers shall be Zinc cast and plated to match finish designation in hardware sets.
  - 6. Roses shall be of solid Brass or Stainless Steel material.
- C. Latch and Strike:
  - 1. Stainless Steel latch bolt with minimum of 1/2-inch throw and deadlocking for keyed and exterior functions. Provide 3/4-inch latchbolt for pairs of fire rated doors where required by door manufacture. Standard backset to be 2-3/4 inches and faceplate shall be adjustable to accommodate a square edge door or a standard 1/8-inch beveled edge door.

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2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4 inches by 4-7/8 inches with proper lip length to protect surrounding trim.
- D. Basis of Design Product: Hager 3400 Series with “August” Lever.

**2.05 DEADBOLTS**

- A. Deadbolts shall be of one manufacturer as listed for continuity of design and consideration of warranty. Manufacturer to be certified by the following:
1. Auxiliary Locks: ANSI/BHMA A156.5 Grade 1.
  2. UL/cUL listed for functions up to 3 hours for “A” label.
  3. UL10C/UBC 7-2 Positive Pressure Rated.
- B. Deadbolt function numbers and descriptions of manufacturer’s series as listed in hardware sets. Material and Design:
1. Latch bolt 1-inch throw, material brass with concealed harden steel roller to prevent sawing or cutting.
  2. Freewheeling collar design to help resist against vandalism.
  3. Non-handed, field reversible.
- C. Basis of Design Product: Hager 3100 Series

**2.06 CYLINDERS AND KEYING**

- A. Cylinders shall be of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Cylinders:
1. ANSI A156.5, Grade 1, 6-pin type removable cylinders. Match existing building cylinders.
  2. Shall be furnished with cams/tailpieces as required for locking device that is being furnished for project.
- C. Keying: Key to existing keying system.
1. Include construction keying.
  2. Keys: Nickel silver. Stamp keys with “DO NOT DUPLICATE”.
  3. Supply keys in the following minimum quantities:
    - a. 2 change keys for each lock.
- D. Basis of Design Product: Hager 3900 Series

**2.07 PUSH/PULL PLATES AND BARS**

- A. Push and pull plates shall be of one manufacturer as listed for continuity of design and consideration of warranty. Manufacturer to be certified by the following:

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1. Architectural Door Trim: ANSI/BHMA A156.6.
  2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).
- B. Push Plates: 0.050-inch thick, square corner and beveled edges with counter sunk screw holes. Width and height as stated in hardware sets.
1. Basis of Design Product: Hager 30S.
- C. Pull plates: 0.050-inch thick, square corner and beveled edges. Width and height as stated in hardware sets, 3/4-inch diameter pull, with clearance of 2-1/2 inches from face of door.
1. Basis of Design Product: Hager H33J.
- D. Push Pull Bar Sets: 1-inch round bar stock with 2-1/2 inches clearance from face of door. Offset to be 3-inches, 90-degree standard. Center to center size should be door width less 2 stile width.
1. Basis of Design Product: Hager H160D.

**2.08 CLOSERS**

- A. Shall be product of one manufacturer. Unless otherwise indicated on hardware schedule, comply with manufacturer's recommendation for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirements, and fire rating. Manufacturer to be certified and or listed by the following:
1. BHMA Certified ANSI A156.4 Grade 1.
  2. ADA Compliant ANSI A117.1.
  3. UL/cUL Listed up to 3 hours.
  4. UL10C Positive Pressure Rated.
  5. UL10B Neutral Pressure Rated.
- B. Material and Design:
1. Provide cast iron non-handed bodies with full plastic covers.
  2. Closers shall have separate staked adjustable valve screws for latch speed, sweep speed, and backcheck.
  3. Provide Tri-Pack arms and brackets for regular arm, top jamb, and parallel arm mounting.
  4. One-piece seamless steel spring tube sealed in hydraulic fluid.
  5. Double heat-treated steel tempered springs.
  6. Precision-machined heat-treated steel piston.
  7. Triple heat-treated steel spindle.
  8. Full rack and pinion operation.
- C. Mounting:
1. Out swing doors shall have surface parallel arm mount closers except where noted on hardware schedule.
  2. In swing doors shall have surface regular arm mount closers except where noted on hardware schedule.

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3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
  4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.
- D. Size closers in compliance with requirements for accessibility (ADAAG). Comply with following maximum opening force requirements. Interior hinged openings: 5.0 lb. Fire rated and exterior openings shall have a minimum opening force allowable by authorities having jurisdiction.
- E. Fasteners: Provide self-reaming and self-tapping wood and machine screws and sex nuts and bolts for each closer.
- F. Basis of Design Product: Hager 5100 Series.

**2.09 PROTECTIVE TRIM**

- A. Size of protection plate: Single doors, size 2-inches less door width on push side of door and 1-inch less on pull side of door. For pairs of doors, size 1-inch less door width on push side of door, and 1/2-inch on pull side of door. Kick plates 10-inches high or sized to door bottom rail height. Manufacturer shall meet requirements for:
1. Architectural Door Trim: ANSI/BHMA A156.6.
  2. UL.
- B. Material and Design:
1. 0.050-inch stainless steel.
  2. Corners shall be square. Polishing lines or dominant direction of surface pattern shall run across the door width of plate.
  3. Bevel top, bottom and sides uniformly leaving no sharp edges. Edges shall be deburred.
  4. Countersink holes for screws. Screw holes shall be spaced equidistant 8-inches center to center, along a centerline not over 1/2-inch in from edge around plate. End screws shall be a maximum of 0.53-inch from corners.
- C. UL Label stamp required on protection plates when top of plate is more than 16-inches above bottom of door on fire rated openings. Verify door manufacturers UL listing for maximum height and width of protection plate to be used.
- D. Basis of Design Product: Hager 194S.

**2.10 STOPS AND HOLDERS**

- A. Wall Stops: Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops when possible. Door stops and holders mounted in concrete floor or masonry walls shall have stainless steel machine screws and lead expansion shields. Manufacturer shall meet requirements for Auxiliary Hardware: ANSI/BHMA A156.16.
- B. Basis of Design Product: Hager 255S, 256S (holder)

## **2.11 DOOR GASKETING AND WEATHERSTRIP**

- A. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing where indicated on hardware schedule. Provide non-corrosive fasteners for exterior applications.
  - 1. Perimeter gasketing: Apply to head and jamb, forming seal between door and frame.
  - 2. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are in closed position.
  - 3. Door bottoms: Apply to bottom of door, forming seal with threshold or floor when door is in closed position.
  - 4. Drip Guard: Apply to exterior face of frame header. Lip length to extend 4-inches beyond width of door.
- B. Standards: Manufacturer shall meet requirements for:
  - 1. Door Gasketing and Edge Seal Systems: ANSI/BHMA A156.22.
  - 2. Shall be BHMA certified for door sweeps, automatic door bottoms, and adhesive applied gasketing.
- C. Refer to Wood Doors specification for Category A or Category B. Comply with UBC 7-2 and UL10C positive pressure where frame applied intumescent seals are required. Provide Hager #720 for single and 720 by 724 for a pair of doors.
- D. Basis of Design Products:
  - 1. Perimeter Gasketing: Hager 721S/720 x 724, adhesive applied, 881S stop applied.
  - 2. Door Bottom Sweeps: Hager 750S.
  - 3. Overhead Drip Guard: Hager 810S.

## **2.12 THRESHOLDS**

- A. Set thresholds for exterior and acoustical openings in full bed of sealant with lead expansion shields and stainless steel machine screws complying with requirements specified in Section 07 92 00 "Joint Sealants". Notched in field to fit frame by hardware installer. Refer to Drawings for special details. Manufacturer to be certified by the following:
  - 1. Thresholds: ANSI/BHMA A156.21.
  - 2. Americans with Disabilities Act Accessibility Guidelines (ADAAG).
- B. Basis of design Products:
  - 1. Saddle Threshold: Hager 413S

## **2.13 SILENCERS**

- A. Where smoke, light, or weather seals are not required, provide three silencers per single door frame, two per double door frame and four per dutch door frame. Manufacturer shall meet requirements for Auxiliary Hardware: ANSI/BHMA A156.16.



- B. Basis of Design Product: Hager 307D for hollow metal frames; 308D for wood frames.

## **2.14 FABRICATION**

- A. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.
- B. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolts.
  2. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

## **2.15 FINISHES**

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

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

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

### **3.02 INSTALLATION**

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- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
  - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.
  - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30-inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
  - 1. Furnish permanent cores to Owner for installation.
- E. Thresholds: Set thresholds for exterior doors and other doors indicated in a full bed of sealant complying with requirements specified in Section 07 92 00 "Joint Sealants."
- F. Stops: Provide wall stops for doors unless overhead stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- H. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

**3.03 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.

**3.04 CLEANING AND PROTECTION**

- A. Clean adjacent surfaces soiled by door hardware installation.

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- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.
- D. Leave manufacturer's protective film intact and provide proper protection for all other finish hardware items that do not have protective material from manufacturer until owner accepts Project as complete.

**3.05 DEMONSTRATION**

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

**3.06 HARDWARE SET SCHEDULE**

- A. Guide: Door hardware items have been placed in sets which are intended to be a guide of design, grade, quality, function, operation, performance, exposure, and like characteristics of door hardware, and may not be complete. Provide door hardware required to make each set complete and operational.
- B. Hardware schedule does not reflect handing, backset, method of fastening and like characteristics of door hardware and door operation.
- C. Review door hardware sets with door types, frames, sizes and details on drawings. Verify suitability and adaptability of items specified in relation to details and surrounding conditions.
- D. The following hardware sets list items of finish hardware required for each opening. The quantities of each type are the responsibility of the finish hardware supplier.

- 1. SET #1: Finish US26D (Shower Rooms)
  - a. Butt hinges
  - b. Cylindrical latchset; Corridor function; "August" lever
  - c. Kick plate
  - d. Wall stop
  - e. Perimeter gasketing
  - f. Door bottom
  - g. Threshold
- 2. SET #2: Finish US26D (Mechanical Rooms)
  - a. Butt hinges
  - b. Cylindrical deadbolt; Double cylinder function
  - c. Latchset; Passage function; "August" lever
  - d. Kick plate
  - e. Wall stop
  - f. Perimeter gasketing
  - g. Door bottom
  - h. Threshold

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3. SET #3: Finish US26D (Laundry Rooms)
  - a. Butt hinges
  - b. Cylindrical deadbolt
  - c. Latchset; Passage function; "August" lever
  - d. Kick plate
  - e. Wall stop
  - f. Perimeter gasketing
  - g. Door bottom
  - h. Threshold

**END OF DOOR HARDWARE**

**SECTION 09 29 00**

**GYPSUM BOARD**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Gypsum Board as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Gypsum board
- B. Related Work Specified Elsewhere:
  - 1. SECTION 06 10 00: Rough Carpentry
  - 2. SECTION 09 30 00: Tiling
  - 3. SECTION 09 91 00: Painting

**1.02 SUBMITTALS**

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

**1.03 DELIVERY, STORAGE AND HANDLING**

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

**1.04 PROJECT CONDITIONS**

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or blotchy surface contamination and discoloration.

**PART 2 – PRODUCTS**

**2.01 PERFORMANCE REQUIREMENTS**

- A. Moisture and Mold-Resistant Assemblies: Provide and install moisture and mold-resistant glass-mat gypsum board products with moisture-resistant surfaces complying with ASTM C 1658 and ASTM C 1177 where indicated on Drawings and in all locations which might be subject to moisture exposure during construction.

## **2.02 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products from Georgia-Pacific Gypsum or comparable products by National Gypsum, USG Corporation or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

## **2.03 GYPSUM BOARD, GENERAL**

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

## **2.04 INTERIOR GYPSUM BOARD**

- A. Gypsum Wallboard: ASTM C 1396/C 1396 M.
  - 1. Basis of Design Product: ToughRock Gypsum Board.
  - 2. Thickness: As indicated on the Drawings
  - 3. Long Edges: Tapered
- B. Gypsum Ceiling Board: ASTM C 1396/C 1396 M.
  - 1. Basis of Design Product: DensArmor Plus High-Performance Interior Panel
  - 2. Thickness: As indicated on Drawings.
  - 3. Long Edges: Tapered.
- C. Moisture and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture and mold resistant core and paper surfaces.
  - 1. Basis of Design Product: DensArmor Plus High-Performance Interior Panel or DensArmor Plus Fireguard High-Performance Interior Panel as required.
  - 2. Core: As indicated.
  - 3. Long Edges: Tapered.
  - 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- D. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
  - 1. Basis of Design Product: DensGlass Sheathing.
  - 2. Core: As indicated.

## **2.05 TRIM ACCESSORIES**

A. Interior Trim: ASTM C 1047

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes: As required and as noted on Drawings.

**2.06 JOINT TREATMENT MATERIALS**

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

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Glass-Mat Gypsum Wallboard: 10-by-10 fiberglass mesh.

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, rounded or beveled panel edges, 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.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.

**2.07 AUXILIARY MATERIALS**

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112-inch thick.
2. For fastening cementitious backer units, use screw of type and size recommended by panel manufacturer.

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

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

**3.02 APPLYING AND FINISHING PANELS, GENERAL**

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16-inch or open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.) except in chases braced internally.
  - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps not less than 8 sq. ft. in area.
  - 2. Fit gypsum panels around ducts, pipes and conduits.
  - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4 to 3/8-inch wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load bearing partitions at structural abutments, except floors. Provide 1/4 to 1/2-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.
- H. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

### **3.03 APPLYING INTERIOR GYPSUM BOARD**

- A. Install interior gypsum board in the following locations:
  - 1. Wallboard Type: As indicated on Drawings
  - 2. Ceiling Type: Ceiling surfaces.
  - 3. Moisture and Mold Resistant Type: As indicated on Drawings and areas subject to moisture and humidity and food preparation areas.
  - 4. Glass-Mat Interior type: As indicated on Drawings.
- B. Single-Layer Application:



1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire resistance rated assembly, and minimize end joints.
  - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
  - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire resistance rated assembly.
3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

### **3.04 INSTALLING TRIM ACCESSORIES**

- A. General: For trim with back flanges intended for fasteners, attached 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.

### **3.05 FINISHING GYPSUM BOARD**

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
  2. Level 2: Panels that are substrate for tile.
  3. Level 3: Where indicated on Drawings.
  4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
  5. Level 5: Where indicated on Drawings.
- E. Glass-Mat Gypsum Sheathing Panel: Finish according to manufacturer's written instructions for use as exposed soffit board.

### **3.06 PROTECTION**

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

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- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**END OF GYPSUM BOARD**

**SECTION 09 30 00**

**TILING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Tiling as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
- a. Ceramic tile
  - b. Waterproof membrane
  - c. Floor Drain with Integrated Bonding Flange
  - d. Prefabricated Shower Components
- B. Related Work Specified Elsewhere:
- 1. SECTION 07 92 00: Joint Sealants
  - 2. SECTION 09 29 00: Gypsum Board
  - 3. SECTION 22 00 00: Plumbing

**1.02 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. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A 108.17, which are contained in “American National Standard Specifications for installation of Ceramic Tile.”
- C. Modulus Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual Tile size, excluding spacer lugs.

**1.03 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 0.5
  - 2. Step Treads: Minimum 0.5.
  - 3. Ramp Surfaces: Minimum 0.8.

**1.04 SUBMITTALS**

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- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- C. Samples for Verification:
  - 1. Full-sized units of each type and composition of tile and for each color and finish required.
  - 2. Full-size units of each type of trim and accessory for each color and finish required.
  - 3. Stone thresholds in 6-inch lengths.
- D. Qualification Data: For qualified Installer.
- E. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- F. Product Certificates: For each type of product, signed by product manufacturer.
- G. Material Test Reports: For each tile-setting and grouting product and special purpose tile.

**1.05 MAINTENANCE MATERIAL SUBMITTALS**

- 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.
  - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

**1.06 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. Stone thresholds.
  - 2. Waterproof membrane.

**1.07 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 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.

**1.08 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.

**PART 2 – PRODUCTS**

**2.01 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. 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.
- D. 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 on exterior or 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.
- E. Factory-Applied Temporary Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by pre-coating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

## **2.02 TILE PRODUCTS**

A. Tile Type CT-#1: Factory-mounted unglazed ceramic mosaic tile.

1. Basis of Design Product: Subject to compliance with requirements, provide products by Daltile; Division of Dal-Tile International Inc. or comparable product by American Olean, American Marazzi Tile, Inc., Crossville, Inc. or approved equal.
2. Price Range: Category B
3. Composition: Impervious natural clay or porcelain.
4. Module size: 2 by 2 inch.
5. Thickness: 1/4-inch
6. Face: Blend, with cushion edges.
7. Tile Color and Pattern: As selected by Architect from manufacturer's full range.
8. Grout Color: As selected by Architect from manufacturer's full range.
9. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide shapes as follows, selected from manufacturer's standard shapes:
  - a. Base: Coved
  - b. External Corners: Bullnose, same size as adjoining flat tile.
  - c. Internal Corners: Field-buttet square corners. For coved base and cap use angle pieces designed to fit with stretcher shapes.
  - d. Tapered Transition Tile: Shape designed to effect transition between thickness of tile floor and adjoining floor finishes of different thickness, tapered to provide reduction in thickness from 1/2 to 1/4-inch across nominal 4-inch dimension.

B. Accent Tile.

1. Same Product as CT-#1; provided in quantity equivalent to 20-percent of the amount of CT-#1.

## **2.03 WATERPROOF MEMBRANE**

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

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

1. Basis of Design Product: KERDI as manufactured by Schluter Systems L.P.
2. Provide manufacture's recommended system accessories, including; seaming membrane, mixing valve seals, pipe seals, etc.

## **2.04 FLOOR DRAIN WITH INTEGRATED BONDING FLANGE**

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- A. Stainless steel floor drain with integrated bonding flange and no-hub outlet, and grate assembly. Grate assembly includes stainless steel grate, height adjustment collar, and lateral adjustment ring.
  - a. Basis of Design Product: -KERDI-DRAIN as manufactured by Schluter Systems L.P.
- B. Drain Housing Material: Stainless Steel
- C. Grate Design, Material and Finish: Design 1 – Arc-shaped and trapezoid-shaped openings, stainless steel Type 304 finish.

**2.05 PREFABRICATED SHOWER COMPONENTS**

- A. Shower Base: Prefabricated, sloped tiled shower tray base, made of lightweight, self-extinguishing expanded polystyrene (PS 40), with recessed drain section and bonded waterproof membrane.
  - a. Basis of Design Product: -KERDI-SHOWER as manufactured by Schluter Systems L.P.
  - b. Drain Location: Center
  - c. Size: As required per Drawings
- B. Shower Curb: Prefabricated waterproof shower curb, constructed of rigid extruded polystyrene foam building element panel, with reinforcement material and polypropylene fleece webbing laminated on both sides for thin-set ceramic tile and dimension stone installations.
  - a. Basis of Design Product: -KERDI-BOARD-SC as manufactured by Schluter Systems L.P.
  - b. Size: 6" by 4-1/2" by length required.

**2.06 SETTING MATERIALS**

- A. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bostik, Inc.
    - b. Laticrete International, Inc.
    - c. MAPEI Corporation
  - 2. Provide prepackaged, dry-mortar mix containing dry, re-dispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
  - 3. For wall applications, provide mortar that complies with requirements for non-sagging mortar in addition to the other requirements in ANSI A118.4.

**2.07 GROUT MATERIALS**

- A. 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. Laticrete International, Inc.
- c. MAPEI Corporation

## **2.08 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: Angle or L-shape, height to match tile and setting bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
- C. Temporary Protective Coating: Product indicated below that is formulated to protect exposed surfaces of tile against adherence or mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
  - 1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with melting point of 120 to 140 deg F per ASTM D 87.
  - 2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- D. 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.
- E. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

## **2.09 MIXING MORTARS AND GROUT**

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturer's written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

## **PART 3 – EXECUTION**

### **3.01 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 adhesives bonded mortar bed or 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.

### **3.02 PREPARATION**

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or 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.
- D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, pre-coat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

### **3.03 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 Tiles" 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. Tile floors in wet areas.

- 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 grid pattern unless otherwise indicated. 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. Provide uniform joint widths unless otherwise indicated.
  - 1. For tile mounted in sheets, make joints between 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: Unless otherwise indicated, install tile with the following joint widths:
  - 1. Ceramic Mosaic Tile: 1/16-inch.
- G. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
  - 1. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in latex-portland cement mortar (thin set).
  - 2. Do not extend cleavage membrane waterproofing or crack isolation membrane under thresholds set in dry-set Portland cement mortar or latex-portland cement mortar. Fill joints between such thresholds and adjoining tile set on cleavage membrane waterproofing or crack isolation membrane with elastomeric sealant.
- H. Grout Sealer: Apply grout sealer to cementitious grout joints 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.

### **3.04 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.

**3.05 CLEANING AND PROTECTING**

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
  - 1. Remove epoxy and latex-portland cement grout residue from tile as soon as possible.
  - 2. 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.
  - 3. 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.

**END OF TILING**

**SECTION 09 67 23**

**RESINOUS FLOORING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Resinous Flooring as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Decorative resinous flooring systems
    - b. Integral resinous base
- B. Related Work Specified Elsewhere:
  - 1. SECTION 06 10 00: Rough Carpentry

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. Samples for Initial Selection: For each type of exposed finish required.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of flooring systems required for this Project.
  - 1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
- B. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

- B. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

#### **1.06 PROJECT CONDITIONS**

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaced to traffic during resinous flooring application and for not less than 24 hours after application unless manufacturer recommends a longer period.

### **PART 2 – PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products from Dur-A-Flex, Inc. which is located at: 95 Goodwin Street, East Hartford, CT 06108, or approved equal.

#### **2.02 RESINOUS FLOORING**

- A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, decorative-aggregate-filled, epoxy-resin-based, monolithic floor surfacing designed to produce a seamless floor and integral cove base.
- B. Basis-of Design Product: Dura-A-Quartz floor system
- C. System Characteristics:
  - 1. Color and Pattern: As selected by Architect from manufacturer's full range.
  - 2. Wearing Surface: Textured for slip resistance.
  - 3. Overall System Thickness: 3/16-inch.
- D. Body Coats:
  - 1. Resin: Epoxy
  - 2. Aggregates: Manufacturer's standard.

#### **2.03 ACCESSORIES**

- A. Primer: Type recommended by manufacturer for substrate and body coats indicated.
- B. Waterproofing Membrane: Type recommended by manufacturer for substrate and primer and body coats indicated.

- C. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

### **PART 3 – EXECUTION**

#### **3.01 PREPARATION**

- A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.
- B. Plywood Substrates: Provide plywood substrate that is sound and non-flexing under the expected load.
  - 1. Plywood substrate shall be exterior or marine grade plywood, new, clean, and smooth finish (NO KNOTS).
  - 2. Provide two layers with staggered joints. Plywood shall be positively fastened with a high quality construction adhesive as well as a 6-inch screw pattern.
  - 3. Plywood substrates shall be prepared according to manufacturer's recommendations.
- C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.
- D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
- E. Treat control joints and other non-moving substrate cracks from reflecting through resinous flooring according to manufacturer's written instructions.

#### **3.02 APPLICATION**

- A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
  - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
  - 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing process.
  - 3. At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.
- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Apply waterproofing membrane, where indicated, in manufacturer's recommended thickness.
  - 1. Apply waterproofing membrane to integral cove base substrates.
- D. Apply grout coat, of type recommended by resinous flooring manufacturer, to fill voids in surface of final body coat and to produce wearing surface indicated.

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- E. Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer.

**3.03 PROTECTION**

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

**3.04 SCHEDULE**

- A. Plywood Substrates

- 1. System Materials:
  - a. Membrane: Elast-O-Coat resin and hardener
  - b. Broadcast Coats: Dur-A-Glaze #4 resin and hardener
  - c. Aggregate: Q-28 colored quartz aggregate
  - d. Grout Coat: Dur-A-Glaze #4 resin and Water Clear hardener
  - e. Topcoat: Armor Top resin and hardener with Dur-A-Grip
- 2. Patch Materials:
  - a. Cover base, Shallow Fill and Patching: Dur-A-Glaze Rapid-Patch
  - b. Deep Fill and Sloping Material (over 1/4-inch): Dur-A-Crete

**END OF RESINOUS FLOORING**

**SECTION 09 91 00**

**PAINTING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Painting as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
    - a. Painting and/or finishing of all interior gypsum drywall, woodwork, and any other surfaces indicated on the Drawings or herein Specified to receive paint.
    - b. All necessary surface preparation.
    - c. Surface preparation, patching and repainting of existing interior walls, partitions, and ceilings as indicated on the Drawings or as otherwise required.
    - d. Back-priming and field touch-up.
    - e. Field testing compatibility of new paint with existing paint or finishes to be covered.
  2. The painting subcontractor shall examine all the Sections of the Specifications and shall thoroughly familiarize himself with all their provisions regarding painting and finishing. All surfaces that are primed or left unfinished by the requirements of other Sections of the Specifications shall be painted or finished as a part of this Section.
  3. The painting subcontractor shall examine the Drawings and note new patches in existing construction. In cases where new finishes are not scheduled for the existing construction, new patches shall be finished to match existing.

**1.02 DEFINITIONS**

- A. Commercial as used in this Section refers to a product well suited for a commercial application.
- B. DFT as used in this Section refers to Dry Film Thickness of the coating.
- C. Enamel refers to any acrylic or alkyd (oil) base paint which dries leaving an eggshell, pearl, satin, semi-gloss or high gloss enamel finish.
- D. DTM as used in this Section refers to paint that is applied Direct To Metal.
- E. Premium as used in this Section refers to the best quality product “top of the line.”
- F. VOC as used in this Section refers to Volatile Organic Compounds found in primers, paints, sealers and stains.
- G. Paints are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 and/or 85 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe the gloss of the products specified. The list below is provided for general guidance; refer to the technical data sheet for the actual gloss/sheen level for each product.



1. Flat: Less than 5 Percent.
2. Eggshell: 5 – 20 Percent.
3. Satin: 20 – 35 Percent.
4. Semi-Gloss: 30 – 65 Percent.
5. Gloss: Over 65 Percent.

### **1.03 ACTION SUBMITTALS**

- A. Product Data: Provide a complete list of all products to be used, with the following information for each.
1. Manufacturer's name, product name and/or catalog number, and general product category.
  2. Cross-reference to specified paint system(s) that the product is to be used in; include description of each system.
  3. Submit specifications and complete range of paint manufacturer's color chips. Non-conformance to specifications and a limited range of color samples shall be considered sufficient reason for rejection of paint manufacturer.
- B. Samples: Submit three paper samples, 5 inches by 7 inches in size, illustrating selected colors for each color and system selected with specified coats cascaded.
- C. Manufacturer's Instructions: Indicate special surface preparation procedures.
- D. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

### **1.04 INFORMATIONAL SUBMITTALS**

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years' experience.
- B. Installer Qualifications: All products listed in this section are to be applied by a Painting Contractor with a minimum of five years demonstrated experience in surface preparation and field application of the same type and scope as specified.

### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Disposal:
1. Never pour leftover coating down any sink or drain. Use up material on the job or seal can and store safely for future use.
  2. Do not incinerate closed containers.

3. For specific disposal or recycle guidelines, contact the local waste management agency or district. Recycle whenever possible.

**1.06 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not apply exterior paints in snow, rain, fog or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

**1.07 WARRANTY**

- A. Inspection of all surfaces to be coated must be done by the manufacturer's representative to insure proper preparation prior to application. All thinners, fillers, primers and finish coatings shall be from the same manufacturer to support a product warranty. Products other than those submitted shall be accompanied by a letter stating its fitness for use and compatibility.
- B. At project closeout, provide to the Owner or owner's representative an executed copy of the Manufacturer's standard form outlining the terms and conditions of and any exclusions to their Limited Warranty against Manufacturing Defect.

**1.08 EXTRA MATERIALS**

- A. At project closeout, supply the Owner or owner's representative one gallon of each product for touch-up purposes. Cans shall be clearly marked with color name, number and type of paint.
- B. At project closeout, provide the color mixture name and code to the Owner or owner's representative for accurate future color matching.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide Sherwin-Williams Company products indicated or comparable product from one of the following:
  1. Duron, Inc.
  2. Benjamin Moore & Company
  3. Pratt & Lambert
  4. PPG Pittsburg Paints
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

**2.02 MATERIALS, GENERAL**

- A. Volatile Organic Compound (VOC) Content:

1. Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - a. Flat Paints and Coatings: 50 g/L.
  - b. Nonflat Paints and Coatings: 150 g/L.
  - c. Dry-Fog Coatings: 400 g/L.
  - d. Primers, Sealers, and Undercoaters: 200 g/L.
  - e. Anticorrosive and Antitrust Paints Applied to Ferrous Metals: 250 g/L.
  - f. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
  - g. Pretreatment Wash primers: 420 g/L.
  - h. Floor Coatings: 100 g/L.
  - i. Shellacs, Clear: 730 g/L.
  - j. Shellacs, Pigmented: 550 g/L.
- B. Compatibility: 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. 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.
- C. Low-Emitting Materials: Interior paints and coatings 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. Colors: As selected by the Architect from manufacturer's full range.

## **2.03 MIXING AND TINTING**

- A. Except where specifically noted in this section, all paint shall be ready-mixed and pre-tinted. Agitate all paint prior to and during application to ensure uniform color, gloss, and consistency.
- B. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.
- C. Where paint is to be sprayed, thin according to manufacturer's current guidelines.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. The Contractor shall review the product manufacturer's special instructions for surface preparation, application, temperature, re-coat times, and product limitations.
- B. The Contractor shall review product health and safety precautions listed by the manufacturer.
- C. The Contractor shall be responsible for enforcing on site health and safety requirements associated with the Work of this Section.

- D. Do not begin installation until substrates have been properly prepared.
- E. Ensure that surfaces to receive are dry immediately prior to application.
- F. Ensure that moisture-retaining substrates to receive paint have moisture content within tolerances allowed by coating manufacturer.
  - 1. Gypsum Board: 12 percent
- G. Examine surfaces to receive coatings for surface imperfections and contaminants that could impair performance or appearance of coatings, including but not limited to, loose primer, rust, scale, oil, grease, mildew, algae, or fungus, stains or marks, cracks, indentations, or abrasions.
- H. Correct conditions that could impair performance or appearance of coatings in accordance with specified surface preparation procedures before proceeding with coating application.

### **3.02 PREPARATION, GENERAL**

- A. Clean surfaces thoroughly prior to coating application.
- B. Do not start work until surfaces to be finished are in proper condition to produce finished surfaces of uniform, satisfactory appearance.
- C. Stains and Marks: Remove completely, if possible, using materials and methods recommended by coating manufacturer; cover stains and marks which cannot be completely removed with isolating primer or sealer recommended by coating manufacturer to prevent bleed-through.
- D. Remove Mildew, Algae, and Fungus using materials and methods recommended by coating manufacturer.
- E. Remove dust and loose particulate matter from surfaces to receive coatings immediately prior to coating application.
- F. Remove or protect adjacent hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items not indicated to receive coatings.
- G. Move or protect equipment and fixtures adjacent to surfaces indicated to receive coatings to allow application of coatings.
- H. Protect adjacent surfaces not indicated to receive coatings.
- I. Prepare surfaces in accordance with manufacturer's instructions for specified coatings and indicated materials, using only methods and materials recommended by coating manufacturer.

### **3.03 SURFACE PREPARATION**

- A. Existing Coatings:

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1. Remove surface irregularities by scraping or sanding to produce uniform substrate for coating application; apply one coat primer of type recommended by coating manufacturer for maximum coating adhesion.
  2. If presence of lead in existing coatings is suspected, cease surface preparation and notify Architect immediately.
- B. Gypsum Board: Repair cracks, holes and other surface defects with joint compound to produce surface flush with adjacent surfaces.

**3.04 APPLICATION, GENERAL**

- A. Application of primers, paints, or coatings, by the Contractor, will serve as acceptance that surfaces were properly prepared in accordance with the manufacturer's recommendation.
- B. Apply each coat to a uniform coating thickness in accordance with manufacturer's instruction, not exceeding manufacturer's specified maximum spread rate for indicated surface; thins, brush marks, roller marks, orange-peel, or other application imperfections are not permitted.
- C. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each coat before applying next coat.
- D. Inspect each coat before applying next coat; touch-up surface imperfections with coating material, feathering, and sanding if required; touch-up areas to achieve flat, uniform surface without surface defects visible from 5-feet.
- E. Remove dust and other foreign materials from substrate immediately prior to applying each coat.
- F. Where paint application abuts other materials or other coating color, terminate coating with a clean sharp termination line without coating overlap.
- G. Where color changes occur between adjoining spaces, through framed openings that are of the same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.
- H. Re-prepare and re-coat unsatisfactory finishes; refinish entire area to corners or other natural terminations.
- I. Before painting, remove hardware, accessories, plates, lighting fixtures and similar items or provide ample protection of such items. On completion of each area, replace items removed.

**3.05 CLEANING**

- A. Clean excess coating materials, and coating materials deposited on surfaces not indicated to receive coatings, as construction activities of this Section progress; do not let dry.
- B. Re-install hardware, electrical equipment plates, mechanical grilles and louvers, lighting fixture trim, and other items that have been removed to protect from contact with coatings.
- C. Reconnect equipment adjacent to surfaces indicated to receive coatings.

- D. Relocate to original position equipment and fixtures that have been moved to allow application of coatings.
- E. Remove protective materials.

### **3.06 PROTECTION AND REPAIR**

- A. Protect completed coating applications from damage by subsequent construction activities.
- B. Repair to Architect's acceptance coatings damaged by subsequent construction activities. Where repairs cannot be made to Architect's acceptance, re-apply finish coating to nearest adjacent change of surface plane, in both horizontal and vertical directions.

### **3.07 PAINTING AND COATING SCHEDULE**

#### **A. Exterior Painting:**

##### **1. Plastic Trim Fabrications, including PVC, plastic and fiberglass items:**

- Prime Coat: Primer, bonding, water-based: S-W PrepRite ProBlock Latex Primer/Sealer Intermediate Coat: Latex, exterior, matching topcoat.
- Topcoat: Latex, exterior, gloss: S-W A-100 Exterior Latex Gloss, A8 Series, at 4.0 mils wet, 1.3 mils dry, per coat.

#### **B. Interior Painting:**

##### **1. Gypsum Board and Plaster:**

##### **a. Walls**

- Prime Coat: Primer, latex, interior: S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils wet, 1.5 mils dry
- Intermediate Coat: Latex, interior, matching topcoat
- Topcoat: Latex, interior, eggshell: S-W ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 Series, at 4.0 mils wet, 1.7 mils dry, per coat

##### **b. Walls (Toilet rooms, showers, kitchens and mechanical spaces):**

- Prime Coat: Primer sealer, latex, interior: S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils wet, 1.5 mils dry
- Intermediate Coat: Light industrial coating, interior, water based, matching topcoat
- Topcoat: Light industrial coating, interior, water based, eggshell: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45-151 Series, at 4.0 mils wet, 1.5 mils dry, per coat

##### **c. Ceilings**

- Prime Coat: Primer, latex, interior: S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils wet, 1.5 mils dry
  - Intermediate Coat: Latex, interior, matching topcoat
  - Topcoat: Latex, interior, flat: S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, at 4.0 mils wet, 1.6 mils dry, per coat
2. Disturbed Work: Disturbed work both interior and exterior caused by construction shall be thoroughly cleaned, repaired and sanded, and given sufficient coats of paint of color to match adjacent work so that the finished work will blend satisfactorily with existing work as approved by the Owner. Test patches shall be made to demonstrate compatibility of new paint materials with existing surfaces.

**END OF PAINTING**

**SECTION 09 93 00**

**STAINING AND TRANSPARENT FINISHING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Staining and Transparent Finishing as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Interior and exterior stains and clear finishes.
    - b. All necessary surface preparation
- B. Related Work Specified Elsewhere:
  - 1. SECTION 07 46 23: Wood Siding

**1.02 DEFINITIONS**

- A. Stains are available in a wide range of opacities from transparent stain that allow all the grain and texture to show to solid colors which mask all the grain but allow the texture to show. The following terms are used to describe the different opacities.
  - 1. Transparent
  - 2. Semi Transparent
  - 3. Semi Solid
  - 4. Solid Color
- B. Varnishes and clear coats are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe gloss levels.
  - 1. Flat: 10 – 20 percent
  - 2. Satin / Low Lustre: 20 – 35 percent
  - 3. Semi Gloss: 35 – 70 percent
  - 4. Gloss: Over 70 percent

**1.03 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Product List: For each product indicated, include the following:



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1. Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in Schedules.
2. VOC content.

**1.04 MAINTENANCE MATERIAL SUBMITTAL**

- 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 1 gallon of each material and color applied.

**1.05 QUALITY ASSURANCE**

- A. Manufacturers Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years' experience.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum five years demonstrated experience in installing products of the same type and scope as specified.

**1.06 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's 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 degrees F.
1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.

**1.07 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Apply finishes only when temperatures of surfaces to be finished and ambient air temperatures are between 50 and 95 degrees F.
- C. Do not apply finishes when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.
- D. Do not apply exterior finishes in snow, rain, fog, or mist.

**1.08 WARRANTY**

- A. At project closeout, provide to the Owner or owner's representative an executed copy of the manufacturer's standard form outlining the terms and conditions of and any exclusions to their Limited Warranty against Manufacturing Defect.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products from one of the following:
1. Benjamin Moore & Co.
  2. Cabot
  3. Minwax
  4. PPG Architectural Coatings
  5. Sherwin-Williams Company (The)
- B. Products: Subject to compliance with requirements, provide product listed in wood finish systems schedule, or approved equal, for the product category indicated.

### **2.02 MATERIALS, GENERAL**

- A. Material Compatibility:
1. Provide materials for use within each finish 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 finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.
- B. VOC Content: For field applications that are inside the weatherproofing system, stains and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
1. Primers, Sealers, and Undercoaters: 100 g/L.
  2. Clear Wood Finishes, Varnishes: 275 g/L.
  3. Clear Wood Finishes, Lacquers: 275 g/L.
  4. Shellacs, Clear: 730 g/L.
  5. Stains: 100 g/L.
- C. Stain Colors: As selected by Architect from manufacturer's full range.

### **2.03 MIXING AND TINTING**

- A. Except where specifically noted in this Section, all stain shall be ready-mixed and pre-tinted. Agitate all stain prior to and during application to ensure uniform color, gloss, and consistency.
- B. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.

- C. Where paint is to be sprayed, thin according to manufacturer's current guidelines.

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affect performance of the Work.
- B. Maximum Moisture Content of Exterior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with finish application only after unsatisfactory conditions have been corrected.
  - 1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

#### **3.02 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 particular 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.

### **3.03 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 or 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.

### **3.04 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 no 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 wood surfaces.

### **3.05 STAINING AND FINISHING SCHEDULE**

- A. Exterior Staining and Finishing:
  - 1. Wood siding:
    - a. Opacity: Transparent or Semi-Transparent, PPG ProLuxe (Sikkens) Cetol SRD RE
    - b. Opacity: Solid, PPG ProLuxe (Sikkens) Rubbol Solid Wood Finish
  - 2. Wood decking and railings:
    - a. Opacity: Transparent or Semi-Transparent, PPG ProLuxe (Sikkens) Cetol SRD RE
    - b. Opacity: Solid, PPG ProLuxe (Sikkens) Rubbol Solid Wood Finish

#### **END OF STAINING AND TRANSPARENT FINISHING**

**SECTION 10 14 00**

**SIGNAGE**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Signage as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Interior Signage
    - b. Accessories

**1.02 SUBMITTALS**

- A. Product Data: Manufacturer's illustrated product literature and specifications to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- B. Shop Drawings: Submit shop drawings indicating sign style, lettering font, foreground and background colors, locations, overall dimensions of each sign.
- C. Submit the following Samples:
  - 1. Selection Samples: For each finished product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
  - 2. Verification Samples: For each finished product specified, two samples, minimum 6-inches square representing actual product, color and patterns.

**1.03 QUALITY ASSURANCE**

- A. Manufacturers Qualifications: Company specializing in manufacturing Products specified in this Section with minimum three years documented experience.
- B. ADA Accessibility Guidelines: Signage shall comply with the ADA Accessibility Guidelines where applicable. Characters and graphics, including but not limited to, copy height, letter stroke, symbols, materials, and finishes indicated on the Drawings are intended as guidelines for compliance. Implement each applicable ADA Guideline. Should conflicts arise, notify the Architect before proceeding.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

- B. Package signs, labeled in name groups.

**1.05 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.06 WARRANTY**

- A. Manufacturer's Warranty: Signage is to be guaranteed for the Life of the Property against defects in materials and workmanship.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products from Encompass Sign Systems which is located at: 2401 Nevada Ln N, Golden Valley, MN 55427, or comparable products by Kroy Sign Systems or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

**2.02 THERMOFORM ACRYLIC SIGNS**

- A. Materials
  - 1. 100% post-Consumer Recycled ABS Plastic suitable for both interior and exterior applications.
  - 2. Acrylic with a tensile strength that meets ASTM D-638 and a flexural strength that meets ASTM D-790. It shall have a self-ignition temperature that meets ASTM D-1929 with a burn rate meeting ASTM D-635, and measuring at D-785 on the Rockwell Hardness scale. Suitable for both interior and exterior environment.
  - 3. Decorative laminate and elements as requested.
- B. Fabrication:
  - 1. Thermoformed plate shall be laser or rotary cut for precise dimensions according to specifications
  - 2. Characters and pictograms shall be compression molded and raised 1/32" to meet ADA compliance regulations.
  - 3. Raised text shall be in all capital letters and accompanied by corresponding Grade 2 Braille.
- C. Signs:
  - 1. Colors:
    - a. Text and graphics as selected by Architect from manufacturer's standard colors.

- b. Background as selected by Architect from manufacturer's standard colors.
- 2. Sign sizes as shown on drawings for each sign type required.
- 3. Text Size: 5/8-inch minimum to 2-inch maximum based on a capital letter "I" spaced a minimum of 1/4-inch away from other lines.
- 4. Font to be selected by Architect from Manufacturer's standard styles.
- 5. Grade 2 Braille to accompany raised text. Braille to be a minimum of 3/8-inch away from all other raised elements and sign edges for ADA compliance.
- 6. Pictograms to be provided as required, and accompanied by the International Symbol of Accessibility when necessary.
- 7. Back Plate Thickness: 1/8-inch minimum.
- 8. Corners: Radius
- 9. Edges: Straight
- 10. Texture: Smooth

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify walls are free of debris and ready for installation of signage prior to proceeding.
- B. Notify Architect of unsatisfactory conditions before proceeding.

#### **3.02 INSTALLATION**

- A. Signs to be installed 60-inches above finished floor to baseline of highest tactile copy maximum, and 48-inches above finished floor to baseline of lowest tactile copy minimum.
- B. Signs to be located 3-inches from latch side of door jamb. Where there is insufficient wall space, signs will be installed on nearest adjacent wall.
- C. Signs to be installed level and plumb.
- D. Signs to be installed with manufacturer's recommended mounting hardware.

#### **3.03 CLEANING AND PROTECTION**

- A. Clean signs in accordance with manufacturer's written instructions.
- B. Protect installed products until completion of project.
- C. Signs shall be free of glue, fingerprints, dirt, grease and any other imperfections.
- D. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SIGNAGE**

**SECTION 10 28 00**

**TOILET, BATH AND LAUNDRY ACCESSORIES**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Toilet, Bath and Laundry Accessories as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Public-use shower room accessories
    - b. Custodial accessories
- B. Related Work Specified Elsewhere:
  - 1. SECTION 06 10 00: Rough Carpentry

**1.02 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.
- B. Warranty: Sample of special warranty.
- C. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

**1.03 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Manufacturer with minimum 5 years' experience in the manufacture of the product types specified. If requested submit a list of successful installations of similar products for evaluation by Architect.
- B. Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Accessibility Requirements: Comply with requirements of ADA/ABA and with requirements of authorities having jurisdiction.

**1.04 COORDINATION**



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- 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.

**1.05 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

**1.06 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.07 WARRANTY**

- A. Manufacturer's Warranty for Washroom Accessories: Manufacturer's standard 1 year warranty for materials and workmanship.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products from Bobrick Washroom Equipment, Inc. which is located at: 6901 Tujunga Ave., North Hollywood, CA 91605-6213, or comparable products by Bradley Corp., or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

**2.02 MATERIALS**

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch nominal thickness.
- D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.
- E. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

- H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

#### **2.03 PUBLIC-USE WASHROOM ACCESSORIES**

- A. Grab Bars:
  - 1. Stainless Steel Grab Bars (with snap flange covers): Bobrick Model B-6806
  - 2. Configuration and Length: As indicated on Drawings.

#### **2.04 PUBLIC-USE SHOWER ROOM ACCESSORIES**

- A. Shower Curtain Rods:
  - 1. Bobrick ClassicSeries Model B-6107
- B. Shower Curtains:
  - 1. Vinyl Shower Curtains and Hooks: Bobrick Model 204
- C. Robe Hooks:
  - 1. Utility Hooks: Bobrick Model B-76717

#### **2.05 CUSTODIAL ACCESSORIES**

- A. Mop and Broom Holder:
  - 1. Bobrick Model B-223 x 24

#### **2.06 FABRICATION**

- A. Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

**3.02    PREPARATION**

- A.     Clean surfaces thoroughly prior to installation.
- B.     Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

**3.03    INSTALLATION**

- A.     Install in accordance with manufacturer's instructions.
- B.     Install supports attached to building structure for equipment requiring supports.
- C.     Grab Bars: Install grab bars to withstand downward force of not less than 250 lbf per ASTM F 446.
- D.     Install equipment level, plumb, and firmly in place in accordance with manufacturer's rough-in drawings.

**3.04    CLEANING AND PROTECTION**

- A.     Protect installed products until completion of project.
- B.     Clean unit surfaces, and leave in ready-to-use condition.
- C.     Turn over keys, tools, maintenance instructions, and maintenance stock to Owner.
- D.     Touch-up, repair or replace damaged products before Substantial Completion.

**3.05    TESTING AND ADJUSTING**

- A.     Test each piece of equipment to assure proper operation, freedom of movement, and alignment. Install new batteries in battery-powered items.
- B.     Repair or replace malfunctioning equipment, or equipment with parts that bind or are misaligned.

**END OF TOILET, BATH AND LAUNDRY ACCESSORIES**

**SECTION 22 00 00**

**PLUMBING**

**PART 1 – GENERAL**

**1.01 SUMMARY**

- A. This Section includes furnishing and installation of complete drainage, water supply, plumbing fixtures and other equipment as described herein and as indicated on the Drawings. It is the intent of contract documents to call for complete, finished work, fully tested and ready for continuous operation.
- B. Includes connections to site sewer and water lines. Before starting any work, coordinate locations and elevations of building services with the Site utilities. Discrepancies, if any, shall be corrected as soon as possible.
- C. Required water meters, backflow prevention devices and pits are to be provided as required by authorities having jurisdiction.
- D. Coordinate voltages of all electrical devices with electrical contractor.
- E. Any apparatus, appliance, material or work not shown on the drawings by mention or reference in the specifications, or incidental accessories necessary to make the work complete and acceptable in all respects and ready for operation shall be furnished, delivered and installed under this section of the specifications without additional expense to the Owner.
- F. Drawings are generally diagrammatic and are intended to convey scope of work and indicated general arrangements of equipment, piping, fixtures, etc.

**1.02 SUBMITTALS**

- A. Submit product data for pipe, tube, fittings, equipment and couplings.
- B. Submit field quality control reports.
- C. Submit maintenance data for specialties and accessories to include in maintenance manuals.
- D. Valve Schedules: For each piping system. Reproduce on standard-size bond paper. Tabulate valve number, piping system, system abbreviation as shown on tag, room or space location of valve, and variations for identification. Mark valves intended for emergency shutoff and similar special uses. Besides mounted copies, furnish copies for maintenance manuals.

**1.03 QUALITY ASSURANCE**

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping System Components and Related Materials," for plastic, potable domestic water piping and components.

- C. Comply with NSF 61, "Drinking Water System Components – Health Effects; Section 1 through 9," for potable domestic water piping and components.
- D. All materials, workmanship and equipment performance shall conform with the latest governing edition of the following standards, codes, specifications, requirements, and regulations:
  - 1. All applicable NFPA standards.
  - 2. State and local building codes and ordinances, and requirements of authorities having jurisdiction.
  - 3. American Society of Mechanical Engineers (ASME).
  - 4. American Society of Testing and Materials (ASTM).
  - 5. American National Standards Institute (ANSI).
  - 6. Underwriter's Laboratories, Inc. (UL).
- E. All work shall be performed by or under the direct supervision of a plumber licensed in the State of New Hampshire. All existing plumbing shall be brought into compliance with the N.H. State Plumbing Code.

#### **1.04 PROJECT CONDITIONS**

- A. Prior to submission of bids, trade contractors shall visit the site and/or review the related construction documents to determine the conditions under which the work has to be performed. Contractor shall report, in writing, to the Architect, any conditions which might adversely affect the contractor's ability to perform the Work.

#### **1.05 WARRANTY**

- A. The trade contractor shall submit manufacturer's warranties for products as specified in this section.
- B. All materials, types of equipment and workmanship furnished under this Section shall carry standard warranty against all defects in material and workmanship for a period of not less than one (1) year from date of Substantial Completion.

### **PART 2 – PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Basis of Design: Subject to compliance with requirements, provide products from one of the manufacturers specified in other Part 2 articles.

#### **2.02 GENERAL MATERIALS**

- A. Water Hammer Arrestors: Install appropriately sized water hammer arrestors at fast closing positive shutoff valves to prevent water hammer.
- B. Escutcheons: At all finished wall penetrations, provide chrome-plated, stamped steel, hinged, split-ring escutcheon with set screw. Inside diameter shall closely fit pipe outside diameter or

outside of pipe insulation where pipe is insulated. Outside diameter shall completely cover the opening in floors, walls, or ceilings.

- C. Unions: Malleable-iron, Class 150 for low pressure and class 250 for high pressure service; hexagonal stock, with ball-and-socket joints, metal-to-metal bronze seating surfaces; female threaded ends.
- D. Dielectric Unions: Provide dielectric unions with appropriate end connections for the pipe materials in which installed (screwed, soldered, or flanged), which effectively isolate dissimilar metals, to prevent galvanic action, and stop corrosion.
- E. Drip Pans: Where required, provide drip pans fabricated from corrosion-resistant sheet metal with watertight joints, and with edges turned up a minimum of 2-1/2 inches. Reinforce top, either by structural angles or by rolling top over 1/4-inch steel rod. Provide hole, gasket, and flange at low point for watertight joint and 1-inch drain line connection.

## **2.03 GENERAL-DUTY VALVES**

### **A. General:**

- 1. Design: Rising stem or rising outside screw and yoke stems except as specified below.
  - a. Nonrising stem valves may be used only where headroom prevents full extension of rising stems.
- 2. Pressure and Temperature Ratings: As required to suit system pressures and temperatures.
- 3. Sizes: Same size as upstream pipe, unless otherwise indicated.
- 4. Lever handles on all ball valves shall be color coded in conformance with ANSI Standard A13.1.
- 5. Subject to compliance with requirements, provide products from NIBCO Inc., Milwaukee Valve Company, Inc., Crane Company, or approved equal.

### **B. Gate Valves:**

- 1. Gate Valves, 2-1/2 Inches and Smaller: MSS SP-80; Class 125, 200-psi cold working pressure (CWP), or class 150, 300-psi CWP; ASTM B 62 cast-bronze body and bonnet, solid-bronze wedge, copper-silicone alloy rising stem, Teflon-impregnated packing with bronze packing nut, threaded or soldered end connections; and with aluminum or malleable-iron handwheel.

### **C. Ball Valves:**

- 1. Ball Valves, 4 inches and Smaller: MSS SP-110, Class 150, 600-psi CWP, ASTM B 584 bronze body and bonnet, 2-piece construction; chrome-plated brass ball, standard port for 1/2-inch valves and smaller and conventional port for 3/4-inch valves and larger; blowout proof; bronze or brass stem; Teflon seats and seals; threaded or soldered end connections:
  - a. Operator: Vinyl-covered steel lever handle.
  - b. Stem Extension: For valves installed in insulated piping.
  - c. Memory Stop: For operator handles.

D. Check Valves:

1. Swing Check Valves, 2-1/2 Inches and Smaller: MSS SP-80; Class 125, 200-psi CWP, or Class 150, 300-psi CWP; horizontal swing, Y-pattern, ASTM B 62 cast-bronze body and cap, rotating bronze disc with rubber seat or composition seat, threaded or soldered end connections.
2. Swing Check Valves, 3 inches and Larger: MSS SP-71, Class 125, 200-psi CWP, ASTM A 126 cast-iron body and bolted cap, horizontal-swing bronze disc, flanged or grooved end connections.
3. Wafer Check Valves: Class 125, 200-psi CWP, ASTM A 126 cast-iron body, bronze disc/plates, stainless-steel pins and springs, Buna N seals, installed between flanges.
4. Lift Check Valves: Class 125, ASTM B 62 bronze body and cap (main components), horizontal or vertical pattern, lift-type, bronze disc or Buna N rubber disc with stainless-steel holder threaded or soldered end connections.

E. Drain Valves: Chrome plated, bronze body with interchangeable solid bronze wedge and screwed-in bonnet, with hose thread end, brass cap and chain, 200 psi.

**2.04 HANGERS AND SUPPORTS**

- A. Hangers for pipe up to and including 4-inches shall be swivel ring, split ring, wrought pipe clamp, band, or adjustable wrought clevis type. Hangers for pipes above 4-inches shall be standard clevis or roller.
- B. Saddles and Shields: Provide saddles and shields under piping hangers and supports, factory-fabricated, for all insulated piping. Size saddles and shields for exact fit to mate with pipe insulation.

**2.05 VIBRATION AND SEISMIC CONTROLS**

- A. Vibration and seismic control devices, manufactured and approved for use, shall be provided as required and as suitable for use and service.
- B. Where seismic restraints are required, the Contractor shall provide calculations, details and locations that are stamped by a professional engineer.

**2.06 IDENTIFICATION**

- A. Provide pipe markers, line markers, valve tags, valve schedule frames, and equipment markers complying with ANSI A13.1 for lettering size, length of color field, colors, and installed viewing angles of identification devices.
- B. Plastic Pipe Markers:
1. Snap-On Type: Provide manufacturer's standard pre-printed, semi-rigid, snap-on, color-coded, pipe markers.
  2. Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers.

3. Install every 40-feet and at each change in direction.
- C. Plastic Line Marker – Underground Type: Manufacturer's standard permanent burial, bright-colored, continuous-printed plastic type, intended for direct-burial service; not less than 6-inches wide and 4 mils thick. Provide tape with printing which most accurately indicates type of service of buried tape.
- D. Plastic Valve Tags: Provide manufacturer's standard solid plastic valve tags with printed enamel lettering, with piping system abbreviation in approximately 3/16-inch high letters and sequenced valve numbers approximately 3/8-inch high, and with 5/32-inch hole for fastener.
- E. Valve Tag Fasteners: Manufacturer's standard solid brass chain (wire link or beaded type), or solid brass S-hooks of the sizes required for proper attachment of tags to valves, and manufactured specifically for that purpose.
- F. Valve Schedule Frames: For each page of the valve schedule. Provide a glazed display frame, with screws for removable mounting on walls. Provide frames of extruded aluminum or plastic with SSB-grade sheet glass or plastic.
- G. Plastic Equipment Markers: provide manufacturer's standard laminated plastic, color coded equipment markers.

## **2.07 PLUMBING INSULATION**

- A. All insulation shall be UL approved for a Flame Spread Rating of not more than 25 and a Smoke Developed Rating of not over 50.
- B. All insulation shall conform to requirements of the International Energy Conservation Code (IECC) current adopted edition.
- C. Pipe insulation shall be fiberglass with ASJ and Zeston fittings or flexible elastomeric thermal insulation.
  1. Cold water shall be 1/2-inch.
  2. Hot water and hot water return shall be 1-inch.
  3. Horizontal storm piping shall be 1-inch.
  4. Roof drain bodies shall be 1-inch.

## **2.08 WATER PIPING**

- A. Underground Domestic Water Piping Within the Building: Type "K" rolled copper with no fittings below slab or Uponor ASTM F876/F877 SDR9 crosslinked polyethylene (PEX-a) piping with ASTM F1960 cold expansion fittings and PEX reinforcing rings installed per manufacturer's instructions.
- B. Aboveground Domestic Water Piping: hard drawn copper tube Type "L" with wrought fittings soldered with lead free solder or Uponor ASTM F876/F877 SDR9 crosslinked polyethylene (PEX-a) piping with ASTM F1960 cold expansion fittings and PEX reinforcing rings installed per manufacturer's instructions.



**2.09 SANITARY WASTE AND VENT PIPING**

- A. Underground Sanitary and Storm Pipe and Fittings: Hub and Spigot, Service Weight (SV) cast iron soil or Schedule 40 PVC with DWV fittings.
- B. Aboveground Sanitary and Storm Pipe Fittings: No Hub, Service Weight (SV) cast iron soil, Schedule 40 PVC with DWV fittings or Type DWV copper pipe and fittings.
- C. Pressure Sanitary and Storm Pipe (Ejector or Sump Pumps: No Hub cast iron, Type DWV copper or Schedule 40 PVC pressure pipe and fittings.

**2.10 PLUMBING FIXTURES**

- A. Provide plumbing fixtures scheduled, at locations indicated on Drawings.
- B. Provide required trim for each fixture including faucets, stops, drains, tail pieces, traps and escutcheons.
- C. Exposed Pipe: Exposed flush, waste and supply pipes at fixtures shall be chromium plated brass pipe, iron pipe size.
- D. Provide all wall hung fixtures with adjustable carriers and fittings with block feet anchor bolted to floor where required in schedules.
- E. Vandalproofing: Provide vandalproof fittings for all fixtures located in areas accessible to the public.
- F. Coin Operated Solenoid Valve: Industrial rated coin operated timer controller, NEMA 3R, scratch and corrosion resistant enclosure, 1/2-inch motor operated water solenoid valves, 120 volt, single phase, 24 volt control transformer.
  - 1. Basis of Design product: Electronic Coin Operated Shower System III as manufactured by Fluid Manufacturing.
- G. Floor Cleanouts: Adjustable floor cleanout with Dura-Coated cast iron body, with watertight ABS tapered thread plug, and round scoriated top, adjustable to floor finish. Top shall be polished nickel bronze. Zurn "Z-1400" or approved equal.

**PART 3 – EXECUTION**

**3.01 GENERAL**

- A. Escutcheons: Install pipe escutcheons for pipe penetrations of wall, ceiling and floor construction.
- B. Sleeves:
  - 1. Install sleeves for passing through concrete and masonry walls, gypsum-board partitions, concrete floor and roof slabs, and where indicated.

- a. Cut sleeves to length for mounting flush with both surfaces.
  - b. Install large enough sleeves to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
  - c. Except for below-grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants equal to neutral-curing silicone sealant, Type S, Grade NS, Class 25.
2. Below Grade, Exterior Wall, Pipe Penetrations: Install cast-iron wall pipes for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.

### **3.02 GENERAL-DUTY VALVE INSTALLATION**

- A. Install valves as indicated, according to manufacturer's written instructions.
- B. Install valves with unions or flanges at each piece of equipment arranged to allow servicing, maintenance, and equipment removal without system shutdown.
- C. Locate valves for easy access and provide separate support where necessary.
- D. Install valves in horizontal piping with stem at or above the center of the pipe.
- E. Install valves in a position to allow full stem movement.
- F. General Application: Use gate, ball, and butterfly valves for shutoff duty; globe, ball, and butterfly for throttling duty.

### **3.03 HANGER AND SUPPORT INSTALLATION**

- A. General: Comply with MSS SP-69 and SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- C. Install hangers and supports to allow controlled movement of piping systems, permit freedom of movement between pipe anchors, and facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- D. All hanger materials shall be same material as the pipe or compatible (no dielectric reactions).
- E. There shall be no contact between stud walls or studs and piping, provide PVC spacers as required.

### **3.04 IDENTIFICATION INSTALLATION**

- A. Install pipe markers on each system. Include arrows showing normal direction of flow.
- B. Locate pipe markers and color bands where piping is exposed in finished spaces; machine rooms and accessible maintenance spaces.

- C. Install valve tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in valve schedule.
- D. Valve Tag Application Schedule: Tag valves according to size, shape, color scheme, and with industry standard captions.

### **3.05 INSULATION INSTALLATION**

- A. Tightly butt longitudinal seams and end joints. Bond with adhesive.
- B. Stagger joints on double layers of insulation.
- C. Apply insulation continuously over fittings, valves, and specialties, except as otherwise indicated.
- D. Apply insulation with minimum number of joints.
- E. Apply insulation with integral jackets as follows:
  - 1. Pull jacket tight and smooth.
  - 2. Double cover circumferential joints with butt strips, at least 4-inches wide, and of same materials as insulation jacket. Secure with adhesive and outward clinching staples along both edges of butt strip and space 4-inches on center.
  - 3. Longitudinal Seams: Overlap seams at least 1-1/2 inches. Apply insulation with longitudinal seam at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4-inches on center.
- F. Interior Walls and Partitions Penetrations: Apply insulation continuously through walls and partitions, except fire-rated walls and partitions. Apply an aluminum jacket with factory-applied moisture barrier over insulation. Extend 2 inches from both surfaces of wall or partition. Secure aluminum jacket with metal bands at both ends. Seal ends of jacket with vapor barrier coating. Seal around penetration with joint sealer.
- G. Floor Penetrations: Terminate insulation underside of floor assembly and at floor support at top of floor.
- H. Flanges, Fittings, and Valves – Interior Exposed and Concealed: Coat pipe insulation ends with vapor barrier coating. Apply premolded, precut, or field-fabricated segments of insulation around flanges, unions, valves, and fittings. Make joints tight. Bond with adhesive.
- I. Hangers and Anchors: Apply insulation continuously through hangers and around anchor attachments. Install saddles, shields, and inserts. For cold surface piping, extend insulation on anchor legs a minimum of 12 inches and taper and seal insulation ends.

### **3.06 PIPING INSTALLATION**

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- A. All water piping must be carefully pitched to facilitate complete seasonal drain-back of the water system. Water piping shall be run parallel and graded evenly to the drainage points. There shall be a 1/2-inch boiler tap type drain valve provided for each low point in the piping, so that all parts of each water system can be readily drawn-off.
- B. Install components having pressure rating equal to or greater than system operating pressure.
- C. Install piping in concealed interior and exterior locations, except in equipment and service areas.
- D. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.
- E. Service Entrance Piping: Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside building at each service entrance pipe.
- F. Water Meters: Rough-in water piping for water meter installation according to utility company's requirements or Division of parks standards. Water meter will be furnished by utility, or if no utility, shall be provided by the Contractor as part of the scope of this Project.
- G. Connect water distribution piping to service entrance piping at shutoff valve, and extend to and connect to the following:
  - 1. Water Heaters: Connect cold-water supply and hot-water outlet piping in sizes required but not smaller than sizes of water heater connections.
  - 2. Plumbing Fixtures: Connect Hot- and cold-water supply piping in sizes required, but not smaller than required by plumbing code.
  - 3. Equipment: Connect hot- and cold-water supply piping as required. Provide shutoff valve and union for each connection.
- H. Valve Installation:
  - 1. Sectional Valves: Install sectional valves close to main on each branch and riser serving plumbing fixtures or equipment, and where indicated. Use only ball valves for piping 2-inch NPS and smaller. Provide valves to isolate each bathroom.
  - 2. Shutoff Valves: Install shutoff valve on each water supply to equipment, on each supply to plumbing fixtures without supply stops, and where indicated. Provide shutoff valves for each individual plumbing fixture. Use only ball valves for piping 2-inch NPS and smaller.
  - 3. Drain Valves: install drain valves for equipment, at base of each water riser, at low points in horizontal piping, and where required to drain water piping.
    - a. Install hose-end drain valves at low points in water mains, risers, and branches.

**3.07 WASTE AND VENT PIPING INSTALLATION**

- A. Extend building sanitary drain piping and connect to sanitary sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building sanitary drains with building sanitary sewers.
- B. Make changes in direction for drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees for short-sweep 1/4 bends may be used on vertical stacks if

change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used in vent lines. Do not make change in direction of flow greater than 90 degrees. Use proper size of standard increasers and reducers if different sizes of piping are connected. Reducing size of drainage piping in direction of flow is prohibited.

- C. Lay buried building drain piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- D. Install drainage and vent piping at the following minimum slopes, unless otherwise indicated:
  - 1. Sanitary Building drain: 2 percent downward in direction of flow for piping 3-inch NPS and smaller; 1 percent downward in direction of flow for piping 4-inch NPS and larger.
  - 2. Horizontal, Sanitary Drainage Piping: 2 percent downward in direction of flow.
  - 3. Vent piping: 1 percent down toward vertical fixture vent or toward vent stacks.
- E. Connect service entrance piping to exterior sewerage and drainage piping. Use transition fitting to join dissimilar materials.
- F. Connect drainage piping to service entrance piping, and extend to and connect to the following:
  - 1. Plumbing fixtures: Connect drainage piping in sizes required, but not smaller than required by plumbing code.
  - 2. Plumbing Specialties: Connect drainage and vent piping in sizes required, but not smaller than required by plumbing code.
  - 3. Equipment: Connect drainage piping as require. Provide shutoff valve and union for each connection. Use flanges instead of unions for connections 2-1/2 inch NPS and larger.

### **3.08 FIXTURE INSTALLATION**

- A. Install fixtures level and plumb according to manufacturers' written instructions, roughing-in drawings, and referenced standards.
- B. Secure supplies to supports or substrate within pipe space behind fixture.
- C. Install individual stop valve in each water supply to fixture. Use gate or globe valve where specific stop valve is not specified.
- D. Install water-supply stop valves in accessible locations.
- E. Seal joints between fixtures and walls, floors, and counters using sanitary-type, 1-part, mildew-resistant, silicone sealant according to sealing requirements in Section 07 92 00 "Joint Sealants". Match sealant color to fixture color. Seal in accordance to the requirements of the International Plumbing Code.

### **3.09 TESTING**

- A. Test service entrance piping and water distribution piping as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
  2. Leave uncovered and unconcealed new, altered, extended, or replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
  3. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.
  4. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
  5. Prepare reports for tests and required corrective action.
- B. Test drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
  2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
  3. Roughing-In Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10 feet of head. Water level must not drop from 15 minutes before inspection starts through completion of inspection. Inspect joints for leaks.
  4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
  5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
  6. Prepare reports for tests and required corrective action.

### **3.10 CLEANING AND DISINFECTION**

- A. Clean and disinfect potable service entrance piping and water distribution piping as follows:
1. Use purging and disinfecting procedure prescribed by the National Standard Plumbing Code or as directed by the Water Department, whichever is the more stringent, or procedure described in either AWWA C651 or AWWA C652 or as described below:

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- a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
  - b. Fill and isolate system according to either of the following:
    - i. Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and let stand for 24 hours.
    - ii. Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for 3 hours.
  - c. Flush system with clean, potable water until chlorine is no longer in water coming from system after the standing time.
  - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows contamination.
2. Prepare and submit reports for purging and disinfecting activities.
  3. Clean interior of piping system. Remove dirt and debris as work progresses.

**END OF PLUMBING**

**SECTION 23 00 00**

**HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Heating, Ventilating and Air Conditioning as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job. The Work shall consist of furnishing and installation of a complete operational ventilation system including miscellaneous items. The HVAC Contractor shall provide all design build services as required to properly size all equipment and accessories for a complete system.
1. The Work shall include, but shall not necessarily be limited to:
- a. Ducted air distribution systems
  - b. Duct insulation
  - c. Louvers, grilles and diffusers
  - d. Exhaust fans
  - e. Air balancing

**1.02 ACTION SUBMITTALS**

- A. Product Data: For all products, equipment and materials.
- B. Close-Out Submittals: Contractor shall furnish binder copies of an operation and maintenance manual for the mechanical systems, indexed, including but not limited to the following information:
- 1. Starting and stopping procedure.
  - 2. Special operating instructions.
  - 3. Routine maintenance procedures.
  - 4. Schedule of periodic servicing and lubrication.
  - 5. Manufacturer's printed operating and maintenance instructions, parts list, illustrations and diagrams.
  - 6. One copy of each wiring diagram.
  - 7. One approved copy of each shop drawing and Contractors layout drawings.

**1.03 QUALITY ASSURANCE**

- A. Manufacturers Qualifications: Manufacturer's with a minimum of five years' experience manufacturing products in this Section shall provide all products listed.
- B. Installer Qualifications: Products listed in this Section shall be installed by a single organization with at least five years' experience successfully installing insulation on projects of similar type and scope as specified in this Section.

**1.04 DELIVERY, STORAGE AND HANDLING**



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- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Deliver materials to the job site in undamaged condition, in original factory sealed containers, clearly labeled with manufacturer's name and product identification.
- C. Materials shall be stored in a protected and safe area as designated by the General Contractor.

**1.05 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.06 WARRANTY**

- A. Provide manufacturer's warranties:
  - 1. The Contractor shall obtain in the Owner's name, the standard written manufacturer's warranties for all materials furnished under this Section where such warranties are offered in the manufacturer's published product data.
  - 2. The Contractor shall furnish a warranty for all work performed by him for a period not less than one (1) year from the date of Substantial Completion.
  - 3. All warranties shall be in addition to, and not in lieu of, other liabilities which the Contractor may have by law or other provisions of the Contract Documents.

**1.07 INSERTS AND OPENINGS**

- A. The layout for such items as chases, openings, sleeves and inserts shall be arranged in advance of construction of the work, and shall be directed and superintended to see that same is carried out without unnecessary cutting of the building. Any damage that may be done to the building by the Contractor's failure to provide the necessary information for required chases, sleeves and openings in advance, shall be repaired and corrected prior to the Owner's acceptance of the building.
- B. All sleeves and inserts required for passage and support of piping and ductwork shall be furnished and installed by the Contractor as walls and floors are constructed.

**1.08 CODES, STANDARDS AND PERMITS**

- A. The work shall comply with requirements of all State and Local codes which apply, and nothing in the Specification shall be interpreted as any infringement of such codes. The following shall apply to the work under this Section:
  - 1. American National Standard Institute Inc. (ANSI)
  - 2. U.S. Department of Commerce, National Bureau of Standards (NBS)
  - 3. American Society of Testing and Materials (ASTM)
  - 4. American Society of Mechanical Engineers (ASME)
  - 5. Underwriters Laboratories Inc. (UL)

6. National Fire Protection Association (NFPA)
  7. Plumbing and Drainage Institute (PDI)
  8. National Electric Manufacturers Association (NEMA)
  9. International Mechanical Code (IMC)
  10. Life Safety Code (NFPA 101)
  11. American Society of Heating, Refrigeration, Air Conditioning Engineers (ASHRAE)
- B. Where materials or equipment are specified to conform to requirements of the listed standards, the Contractor shall submit proof of such conformance. The label or listing of the specified agency will be acceptable evidence.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Source Limitation: Obtain products from a single source from a single manufacturer.

### **2.02 DUCTWORK**

- A. Sheet metal ductwork shall be galvanized steel, smooth inside and true to size. Duct construction, gauges, specifications and supports shall be in accordance with recommendations of the current edition of SMACNA Duct Construction Standards. No standards for ductwork other than SMACNA shall be accepted. All ductwork shall be 1-inch water gauge pressure class.
- B. All joints and seams of all ductwork shall be sealed with UL labeled sealer as manufactured by 3M Company or United Sheet Metal.
- C. Sheet metal elbows shall have a radius of 1 1/2 times the duct width measured by duct centerlines. Where conditions will not permit or where indicated on drawings use miter turns with double wall turning vanes.
- D. Provide air splitter dampers where indicated on Drawings and where required for adjustment of air distribution to respective duct branches. Splitter damper shall be constructed in accordance with applicable SMACNA Standards.
- E. Provide factory fabricated volume dampers in all supply, return and exhaust branch ducts and where indicated on Drawings. Volume dampers shall be constructed in accordance with applicable SMACNA Standards.
- F. After and during assembly of ducts, clean all dirt, grease, rubbish, etc. from both the interior and exterior of ductwork.
- G. After installation, ductwork shall be tested. Where specified compound is used to seal seams, ductwork shall not be subject to air pressure for a period as recommended by the manufacturer but at least 48 hours after assembly.
- H. Where ducts are insulated, provision shall be made for a neat installation of finish around damper operation quadrant, test slots, test openings, access doors and similar operation devices.

**2.03 EXHAUST FAN**

- A. Steel In-Line Fans: Straight airflow nonoverloading, steel centrifugal wheel with backward curved fan, statically and dynamically factory balanced, heavy gauge steel housing, reinforced, prime coated, internal 1/2-inch thick mat faced glass fiberboard acoustical material, access panel, companion flanges and support brackets, direct drive motor with variable speed drive. As manufactured by Greenheck, ACME, Carnes, Penn, Cook or approved equal.

**2.04 GRILLES AND DIFFUSERS**

- A. Grilles and diffusers shall be aluminum construction with horizontal front bars on 3/4-inch spacing and set at 45 degrees. White finish. Key operated opposed blade damper. 1-1/4 inch wide flange with sponge rubber gasket. Titus "3-FL" or Anemostat, Carnes, Krueger, Metalaire, price or approved equal.

**2.05 INSULATION**

- A. All supply ductwork shall be insulated with 3-inch foil faced fiberglass insulation, all intake and exhaust ductwork shall be insulated with 1-1/2 inch foil faced fiberglass insulation. All insulation shall be stapled and taped.

**2.06 ACCESS DOORS**

- A. Provide where necessary in ductwork or casings, suitable access doors and frames to permit inspection, operation and maintenance of all valves, controls, fire dampers, filters, bearings, or other apparatus concealed behind the sheet metal work. All such doors in insulated ducts to be double panel insulated of not less than 20-gauge. Access doors in un-insulated ducts may be of single panel construction of not less than 18-gauge galvanized steel, and shall have sponge rubber gaskets around their entire perimeter.

**2.07 ACCESS PANELS**

- A. Provide hinged metal access panels set in frames with countersunk screws meeting code requirements for fire resistivity at all locations where valves, dampers, or equipment are concealed in walls or ceilings. Panels shall be omitted when ceiling is constructed of lift-out tiles. Panels shall be as manufactured by Milcor steel Co. or approved equal.

**2.08 LOUVERS**

- A. Factory constructed aluminum louvers. 4-inch deep stormproof blades. Mullions where blade length exceeds 60-inches with 1/2-inch mesh, 14 gauge wire, aluminum birdscreen secured in removable frame, secured to back of louver, extruded sections 6063-T5 alloy, 0.8-inch minimum thickness, 4-inch deep unless otherwise called for. One piece structural head. Sill extension and sill style as required. Stainless steel fasteners. Anodized finish color as selected by Architect. As manufactured by Construction Specialties, Airolite or approved equal.

**2.09 VIBRATION ISOLATION**

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- A. Unless otherwise noted, all rotating mechanical equipment shall be mounted and/or hung on vibration isolators to prevent the transmission of vibration and mechanically transmitted sound to the building structure. All duct connections to equipment shall be made with canvas connections.

**2.10 MOTORS**

- A. Single phase, 60 hz, in compliance with NEMA, Class B temperature rise, 1.15 Minimum service factor, 20,000 hour bearings. Premium efficiency type IEEE Standard 112 Method B. Motors for general purposes shall be open-drip-proof, dusty or open to weather shall be TEFC. As manufactured by General Electric, Gould, Reliance, Westinghouse or approved equal.

**PART 3 – EXECUTION**

**3.01 INSTALLATION**

- A. The HVAC systems and all associated work shall be furnished and installed in accordance with all specified codes for the service intended.
- B. It is the intent of the Specifications and Drawings that the systems shall be furnished and installed complete.
- C. The HVAC Contractor shall furnish and install all piping, ductwork, insulation, valves, equipment, devices and controls needed and usually furnished in connection with such work whether specifically mentioned or not.
- D. The work shall be carried on under the usual conditions affecting the construction of the type involved, in conjunction with other operators at the site. The HVAC Contractor shall cooperate with the Architect and all Contractors working on the site. He shall coordinate his work with theirs and shall proceed in such manner as not to delay or hinder in any way the progress of the work as a whole. In case of dispute, the Architect shall render a decision which shall be final.
- E. The HVAC Contractor shall secure instructions from the General Contractor as to space for storing materials and tools and shall remove all debris, unused materials and equipment from the premises as promptly as possible.
- F. Piping and ductwork shall be concealed within finished walls and ceilings and under floors and shall be kept 6-inches away from parallel runs of electric wiring. Piping, ductwork and equipment shall be supported and secured at proper intervals. Exposed piping shall have runs installed parallel or perpendicular to walls or structural members. Crushed or deformed piping and ductwork shall not be installed.
- G. Care shall be taken to prevent lodgement of plaster, dirt, or trash piping, ductwork, valve fittings and equipment during the course of construction. Clogged equipment and/or material shall be entirely freed of constriction or shall be replaced.
- H. Piping shall be secured by pipe straps or shall be supported by wall brackets, strap hangers, or ceiling trapeze, fastened by wood screws on wood, expansion bolts on concrete or brick and machine screws or welded threaded studs on steel work.

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- I. Flexible connections of short length shall be provided for motors and equipment subject to vibrations or movement.
- J. Access panels, if required for mechanical work, shall be furnished by the HVAC Contractor for installation by the applicable trade.
- K. The HVAC Contractor shall consult all Contract Drawings which may affect the location of any outlets, apparatus and equipment to avoid all possible interference and permit full coordination with all work. The right to make any reasonable change in location to outlets, apparatus or equipment up to the time of roughing-in, is reserved by the Architect, and such changes shall be made without additional cost to the Owner.
- L. It shall be the responsibility of the HVAC Contractor to see that all mechanical equipment is made accessible. Valves, controls, and such other apparatus as may require maintenance and operation from time to time shall be positioned to facilitate servicing.

**3.02 WORKMANSHIP**

- A. All work shall be executed in a workmanlike manner and shall present a neat and mechanical appearance.
- B. All ducts and pipes shall be run parallel or perpendicular to building grid lines, and shall be properly graded.
- C. All pipe connections shall be made in a manner which will allow for freedom of movement during expansion and contraction.
- D. Swing joints, expansion loops and expansion joints with proper anchors required to provide flexibility shall be provided as if they were shown, at no additional cost to the Owner.

**3.03 PROTECTION**

- A. The HVAC Contractor shall take particular care to protect any finished work from damage caused thereto by his operations or the operations of any other Contractors.
- B. The HVAC Contractor shall provide suitable protection of all equipment furnished under this Contract while stored at the job site and after installation. This protection shall be suitable to guard equipment items against damage from the weather or from construction activity. Such protection shall not be removed until directed by the Architect. The interior and exterior of all ducts, piping and equipment shall be kept in a clean condition, free from dirt and debris. All piping, duct, and equipment items shall be thoroughly cleaned before start-up of any equipment or system.

**3.04 CONTROLS, ADJUSTING AND BALANCING**

- A. Provide a complete automatic control system.
  - 1. Provide wiring and conduit as required to connect devices furnished as part of or adjunctive to this automatic control system regardless of supply. Power and control

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circuits, 120 volt maximum, to electrical panels. Install wiring in accordance with Division 26 "Electrical" and National Electric Code.

2. Provide wiring, conduit and devices required for proper system operation, including special electrical switches, transformers, disconnect switches, relays, circuit breaker protection, and other devices as required.

**B. Exhaust Fans**

1. Fan shall operate whenever the occupancy sensor detects activity and shall remain operating for 30-minutes.
2. Fan shall operate whenever the light switch is activated and shall remain operating for 30-minutes after the light switch is turned off. Delay shall be provided by the use of a Timing Relay.

**C. Adjusting and Balancing:** Balancing report shall be typed and three copies submitted for review, results shall be guaranteed. Contractor shall be subject to recall to site to verify report information before acceptance of the report by the Owner's representative.

1. Balancing Contractor shall follow the procedures of the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB).
2. Place systems in satisfactory operating condition. Adjusting and balancing shall be accomplished as soon as systems are complete and before Owner takes possession. Change pulleys as required to meet system performance requirements. Perform necessary mechanical adjustments in conjunction with balancing procedure. Replace dampers in systems that cannot be manipulated to satisfy balancing requirements.
3. Air Systems: Test and adjust fan rpm to design requirements. Test and record motor no load and full load amperes, and determine operating brake horsepower. Test and record system static pressures, suction and discharge. Test and adjust zones and system for design exhaust air CFM. Test and adjust system for design outside air CFM.

**END OF HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**

**SECTION 26 00 00**

**ELECTRICAL**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Electrical systems as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job. The Electrical Contractor shall provide all design build services as required to properly size all equipment and accessories for a complete system in accordance with the latest version of the State Electrical Code.
  - 1. The Work shall include, but shall not necessarily be limited to:
    - a. Electrical service
    - b. Conductors and grounds
    - c. Wiring devices and plates
- B. Related Work Specified Elsewhere:
  - 1. SECTION 23 00 00: Heating, Ventilating and Air Conditioning
- C. The information shown on the Drawings is diagrammatic only and indicates the general arrangement of systems and equipment. Basic design concepts must be followed or bettered. The Contractor shall be responsible for coordinating and designing a complete and functional system.
- D. Coordinate utility service work with local utility companies, general contractor, building conditions and site conditions prior to installation. Provide advance coordination as required for timely connections of temporary and permanent services. Contact utility companies prior to submission of bid. Include all utility fees and costs related to this project in bid.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For all products, equipment and materials.
- B. Record Drawings: Shall be submitted at the conclusion of the electrical work. They shall show any revisions, deviations, or changes from the electrical drawings in the contract set of documents. A print of the contract documents neatly marked up and annotated will be acceptable.
- C. Operating and Maintenance Manuals: Before final acceptance of project, submit three (3) copies of complete operating instructions and service manuals neatly bound and consisting of a neatly typewritten index, instructions on equipment operation, parts replacement information, guarantees and warranties, testing reports, service manuals, control drawings and diagrammatic charts.

**1.03 QUALITY ASSURANCE**

- A. All material and equipment shall bear a certification of a national certifying organization such as Underwriters Laboratory or Factory Mutual and be installed according to the National Electric Code, local rules and regulations and all other codes and standards listed elsewhere in these Specifications or on the Drawings.
- B. Execute work in a neat and workmanlike manner in conformance with best modern trade practice, (i.e. IEEE, NEC, ANSI, NFPA, NEMA) by competent, experienced, licensed electricians, presenting a neat appearance when completed. Replace work not approved by Owner's representative without additional charge.

**1.04 DELIVERY, STORAGE AND HANDLING**

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Materials shall be delivered to the site in the original sealed containers or packages bearing the manufacturer's name and brand designation. All materials shall be stored in a clean, well-ventilated, warm area. Care shall be exercised in handling materials during delivery, storage and installation.

**1.05 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

**1.06 WARRANTY**

- A. The Contractor shall warranty all materials and installations under normal use to be free from defects and poor workmanship for a period of one (1) year from the date of Substantial Completion. Any replacement of parts or adjustments, including labor made necessary by inherent defects, shall be provided by the Contractor without cost to the Owner within the warranty period.

**1.07 CODES AND STANDARDS**

- A. The complete installation shall be in compliance with the applicable latest or accepted edition of the International Building Code as adopted by the State of New Hampshire, NFPA and other applicable rules and regulations prescribed by the authority having jurisdiction.

**PART 2 – PRODUCTS**

**2.01 MATERIALS, GENERAL**

- A. Unless otherwise indicated, the materials to be furnished under this Section shall be the standard products of manufacturer's regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design that complies with the Specification requirements.



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- B. Source Limitation: Obtain products from a single source from a single manufacturer.

**2.02 EQUIPMENT MOUNTING AND SUPPORTS**

- A. Provide all supports including supplementary steel, channels, chains, rods and guys required for the proper installation, mounting and support of all equipment.
- B. Supports shall be firmly attached to building structural elements and constructed in an approved manner. Continuously threaded rods less than 3/8-inch in diameter, tie wire, or metal straps are not approved.
- C. Except as otherwise required by the Contract Documents the type and size of supports shall be as determined by the Contractor and shall be of sufficient strength and size to allow only a minimum deflection as required by codes or standards and support the manufacturer's requirements for loading.
- D. Inform all parties as to the location, size, details and method of attachment of supports and the weight which support is to carry, so that the installation may be coordinated.
- E. Supports shall be installed in a neat and workmanlike manner, perpendicular or parallel to walls, floor, columns, beams or ceiling.

**2.03 GROUNDING**

- A. Furnish and install grounding systems conforming to IEEE std. 142-1982 and 241. Comply with requirements of NEC, Article 250 pertaining to electrical grounding system. Comply with applicable requirements of U.L. Standards numbers 467 and 869 pertaining to electrical grounding and bonding. Provide grounding products which are U.L. listed and labeled.
- B. Provide electrical grounding systems required including but not limited to cables, wires, connectors, terminals (solderless lugs), grounding rods/electrodes, plate electrodes, bonding jumper braid, surge arrestors, and additional accessories needed for complete installation.
- C. Provide electrical bonding plates, connectors, terminals, lugs, and clamps as recommended by manufacturer for required applications.
- D. Ground rods shall be solid copper 5/8-inch diameter and 10-feet long.
- E. Upon Completion of installation of electrical grounding systems, test ground resistance. Where tests show resistance to ground is over 3 ohms take appropriate action to reduce resistance to 3 ohms or less by driving additional ground rods and/or by chemically treating soil encircling ground rod. Then retest to demonstrate compliance.
- F. All feeder, subfeeders, lighting branch circuits and all receptacle circuits shall contain a grounding conductor minimum No. 12 copper with green insulation.
- G. Grounding terminal on receptacles shall be bonded to outlet box with grounding conductor to establish grounding continuity
- H. Flexible conduit and electric metallic tubing feeder raceways shall include grounding conductor.

- I. Grounding conductors shall be stranded copper wire with THHN green insulation.
- J. Grounding bushings shall be provided for all raceways.

#### **2.04 WIRING IN CONDUIT**

- A. Type MC (metal clad cable) shall be used for branch circuits including power, lighting and control per NEC.
- B. Electrical metallic tubing (EMT) shall be used for all feeders and empty conduit systems. EMT may be used for branch circuits including power, lighting and control per NEC. EMT shall not be used where subject to water or moisture conditions. Threadless couplings and connectors used with EMT shall be made up tight. Minimum size of conduit to be 3/4-inch.
- C. Connections to portable equipment from junction boxes and conduit termination to motors shall be made with liquid-tight flexible metal conduit, finished black or grey to match equipment. Flexible connections shall be maximum of 18-inches long with grounding conductor.
- D. Under slab wiring shall be installed in schedule 40 rigid PVC conduit. Comply with NEMA Standards. Under slab conduit shall be 3-inch diameter.

#### **2.05 CONDUCTORS**

- A. All conductors installed in raceway shall be insulated, type THW or THWN, 600 volt service, within building and for secondaries. All such wiring shall be color coded. Conductors with higher insulation temperature ratings shall be provided as required.
- B. Conductor and conduit sizes shown on the drawings are based on copper conductors with THW insulation, unless otherwise noted.
- C. Joints and splices shall be made in a manner equivalent electrically and mechanically to the conductor itself. Connections shall be of the compression type.
- D. Where receptacles or convenience outlets are specified to serve equipment, furnish, install and connect approved flexible cable and cap to equipment.
- E. Make all final connections, flexible or fixed as required to all equipment shown requiring final electrical connections.
- F. Wire, conductors and cable shall be as manufactured by General Electric Company, Rome Cable, General Cable Corporation or approved equal.

#### **2.06 WIRING DEVICES**

- A. Switches, receptacles and other utilization devices shall be as manufacture by Leviton, General Electric, Hubbell or approved equal. Symbols and nomenclature is that of Leviton. Switches shall have a minimum rating of 20 amperes.

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- B. All receptacles and switches shall have a grounding pole and grounding terminal, which shall be connected to the outlet box with grounding conductor to establish grounding continuity.
- C. Verify mounting height of all devices prior to roughing.
- D. Provide heavy-duty duplex receptacles, 2 pole, 3 wire grounding, 20 amperes, 125 volts, with metal plaster ears, back and side wiring, NEMA configuration 5-20R.
- E. Provide device plates for all devices, switches, and receptacles and miscellaneous outlets. Plates shall be stainless steel with ganging and cut-outs appropriate to the indicated circuiting.

**2.07 PULL BOXES AND JUNCTION BOXES**

- A. Pull boxes and junction boxes shall be of code gauge galvanized steel with screw covers to match, shall be as required and shall be as shown on the Drawings.
- B. Conductors passing through pull boxes shall be identified to indicate their origin and termination.
- C. Pull and junction boxes and covers shall be for indoor use, except provide other types as required because of location.
- D. Covers shall not be installed until installation has been observed. Provide nameplate on cover.

**2.08 NAMEPLATES**

- A. Provide nameplates for panelboards, switch panels, relays, empty raceways, contactors, pull boxes, junction boxes, motor disconnect switches, and remote switches designating equipment controlled and function.

**2.09 OUTLETS**

- A. Outlets shall be centered in panels and spaces provided therefore.
- B. Where outlets of any system occur provide suitable boxes and conduit so that they may be built in as the work progresses. Box offsets shall be made at all outlets to provide proper adjustment to structural finish.
- C. Receptacle outlet boxes shall have factory installed grounding conductor which shall be connected to receptacle grounding terminal.
- D. Fixture outlet boxes shall have 3/8-inch solid male fixture studs.
- E. Raised covers in open frame construction where no other finish is to be applied, shall have 90 degree corners and edges. Boxes in wall panel finish shall have raised stainless steel covers with rounded edges and corners.
- F. Exposed outlet boxes shall have threaded conduit hubs.

**2.10 LIGHTING FIXTURES AND LAMPS**

- A. Fixtures shall be complete with all accessories such as close nipples, extension couplings, connecting straps, screws, locknuts, hickies and plaster rings, to provide complete fixture installation for use with any type of standard outlet or switch box. Special fittings required to support fixtures shall be supplied.

## **2.11 TERMINAL STRIPS**

- A. All terminal strips for electrical wiring shall be mounted on a separate 3/8-inch select grade backboard within cabinets or boxes. All terminal strips shall be rated for the ampacity of the wire intended to be connected, but in no case less than twenty amps. All terminal strips shall be identified and each wire at every terminal shall be identified by means of a Brady wire tag.

## **2.12 SAFETY SWITCHES**

- A. Safety switches shall be heavy duty, with ampere rating number of poles, fusible or non-fusible as indicated or required. Manufacturer shall be ITE, G.E., Sylvania, Square D or Westinghouse.

# **PART 3 – EXECUTION**

## **3.01 RACEWAYS AND CONDUIT**

- A. Raceways shall be supported and secured at intervals of not more than 10 feet, with minimum of two supports. Tie wire or perforated metal straps shall not be used to support or secure raceways or other equipment. Electric metallic tubing shall be supported within 18-inches of each coupling or connector. In finished areas, furnish and install escutcheons for all exposed conduit passing through or entering finished floors or walls.
- B. Raceways shall have runs installed parallel or perpendicular to walls, structural members or intersections of vertical planes and ceilings. Field-made bends and offsets shall be avoided where possible, but where necessary, shall be made within an approved hickey or conduit bending machine. Crushed or deformed raceways shall not be installed. Trapped raceways shall be avoided. Care shall be taken to prevent the lodgement of plaster, dirt or trash in raceway boxes, fittings and equipment during the course of construction. Clogged raceways shall be entirely free of obstructions or shall be replaced. Wooden plugs inserted in concrete or masonry are not acceptable as a base for raceway fastenings nor shall raceways or pipe straps be welded to steel structures. Raceways shall be secured by pipe straps or shall be supported by wall brackets, strap hangers or ceiling trapeze fastened by wood screws on wood, toggle bolts on hollow units, expansion bolts on concrete or brick and machine screws or welded studs on steel work.

## **3.02 OUTLETS**

- A. Each outlet in the wiring or raceway systems shall be provided with an outlet box to suit the conditions encountered. Each box shall have sufficient volume to accommodate the number of conductors entering the box in accordance with the requirements of the National Electric Code. Boxes shall not be less than 1-1/2 inches deep unless shallower boxes are required by structural conditions and are specifically approved.

- B. Ceiling and bracket outlet boxes shall be not less than 4-inches except smaller boxes may be used where required by the particular fixture to be installed. Boxes shall be installed in a rigid and satisfactory manner and shall be fastened directly with wood screws on wood, bolts and expansion shield on concrete or brick, toggle bolts on hollow masonry units and machine screws or welded threaded studs on steel work. Threaded studs driven in by a powder charge and provided with lock washers and nuts are acceptable in lieu of wood screws, expansion shields or machine screws if permitted by local authorities.

**3.03 FIXTURES**

- A. All fixtures shall be supported by building structural elements independent of furred or suspended ceilings.
- B. The minimum number of supports for surface mounted or suspended fixtures shall equal one for each 48-inches of length plus one additional support. Additional supports shall be provided if required.

**END OF ELECTRICAL**