PROJECT MANUAL
FOR

Union School District
Hutchinson Elementary School Roof Repair

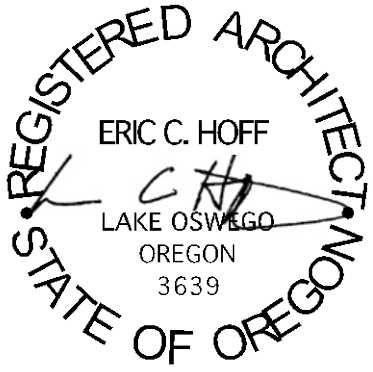
540 S Main Street
Union, Oregon 97883

OWNER:

Union School District
P.O. Box K
Union, Oregon 97883

ARCHITECT:

HOFF ARCHITECTURE /
STRUCTURAL WATERPROOFING CONSULTANTS, LLC
9450 SW Commerce Circle
Suite 410
Wilsonville, Oregon 97070
(503) 454-0527



Job No. 200131A-OR
Date: February 25, 2020

UNION SCHOOL DISTRICT
HUTCHINSON ELEMENTARY SCHOOL ROOF REPAIR
UNION, OREGON

DESIGN TEAM

ARCHITECT

HOFF ARCHITECTURE, LLC
STRUCTURAL WATERPROOFING CONSULTANTS, LLC
Eric Hoff, Architect — Phone: (503) 454-0527
9450 SW Commerce Circle, Suite 410
Wilsonville, Oregon 97070

ENVIRONMENTAL ENGINEER

PBS ENGINEERING & ENVIRONMENTAL INC.
Wayne Sehman
4412 SW Corbett Avenue — Phone: (503) 417-7598
Portland, Oregon, 97239

PROJECT MANAGEMENT

WENAHA GROUP.
Cassie Hibbert
125 SE Court Ave., Suite A — Phone: (541) 561-3497
Pendleton, Oregon, 97801

DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS

INTRODUCTORY INFORMATION

BIDDING REQUIREMENTS

CONTRACTING REQUIREMENTS

DIVISION 01 GENERAL REQUIREMENTS

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Invitation to Bid
Union School District #5 – Hutchinson Elementary School Roof Repair

The Union School District – School Buildings Roof Repair project consists of:

A. Base Bid #1: Hutchinson Elementary School Roof Repair
   a. Removal of all metal flashings.
   b. Removal of existing built-up roof and composition shingle roof systems.
   c. Repair of damaged existing structural sheathing and framing system.
   d. Repair of damage concrete parapet side walls over building entry.
   e. Temporary removal of mechanical ductwork.
   f. Removal of existing gutter system and reinstallation of the new gutter/downspout system with splash block at bottom of downspouts.
   g. Removal of damage wood fascia trim behind existing gutters and installation of new trim to match existing.
   h. Installation of new PVC single ply membrane, vapor barrier and cover board.
   i. Installation of new composition shingle on steep sloped portion of the roof area.
   j. Installation of new parapet cap flashing above the building entry and rear mechanical room.
   k. Reinstallation of all temporary removed electrical and mechanical items.
   l. Disposal of debris

Union School District #5 Superintendent Carter Wells **will receive sealed bids in writing from qualified contractors until 2 p.m. Pacific Daylight Time, Monday, March 30** at the Union School District Office, 540 Main Street, Union, OR 97883 for the construction of the Hutchinson Elementary School Roof Repair, at which time the bids will be opened and read aloud to all in attendance. Bids received after the time fixed for opening will not be considered.

The First-Tier Subcontractor Disclosure Form must be submitted in a separate envelope within two (2) business hours after the advertised bid closing time.

PRE-BID CONFERENCE: A mandatory pre-bid conference will be held at 11:00 a.m. Pacific Daylight Time, Monday, March 16, 2020. Meet in front of Hutchinson Elementary (1st Street between Dearborn and Center Streets).

BID DOCUMENTS FOR CONTRACTORS: Electronic bid documents are available by contacting Cassie Hibbert, Wenaha Group Project Manager at chibbert@wenahagroup.com.

If a bid is greater than $50,000, it will not be considered unless the bid contains a statement by the bidder, as part of his or her bid, that the provisions required by ORS 279C.800 through ORS 279C.870 (workers on public works to be paid not less than prevailing rate of wage) shall be included in his contract. The current wage rates applicable to this project are available at www.boli.state.or.us.

If a bid is greater than $100,000, it will not be considered unless accompanied by certified check, cashier's check, or bid bond made payable to Union School District #5 in an amount equal to ten percent (10%) of the Basic Bid. Interest will not be allowed on bid security.

It shall be understood and mutually agreed by and between the Contractor and Owner that the date of beginning and time for completion of the project are essential conditions of the contract and that the time for beginning and completion of the project shall be considered by the Owner in awarding the contract.

No bidder may withdraw his bid after the hour set for the opening thereof, or thereafter, before award of the contract, unless award is delayed for a period exceeding thirty (30) days from the Bid Opening date. The Owner reserves the right to waive any irregularities in the bids, to reject any or all bids, and to accept only such bids as may be in the Owner's best interest.

Carter Wells
Union School District #5 Superintendent

END OF DOCUMENT

INSTRUCTIONS TO BIDDERS

PART 1 GENERAL

1.1 SUMMARY

A. This construction will be carried out under one General Construction Agreement covering the construction work on this project. "The General Conditions of the Contract for Construction" of the American Institute of Architects will be referred to as the "General Conditions" throughout this Project Manual. This agreement includes all labor, materials, transportation, equipment and services necessary for and reasonably incidental to the completion of all work in connection with the project described in this Project Manual and the accompanying Drawings.
   1. Drawings Dated: February 25, 2020
   2. Project Manual Dated: February 25, 2020
   3. Published Addendum:

1.2 DEFINITIONS

A. Project Documents include the Invitation to Bid, Instructions to Bidders, Bid Form and supporting exhibits, including any addenda issued prior to receipt of bids. Addenda are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the Project Documents by additions, deletions, clarifications or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.

1.3 DESCRIPTION OF QUOTE REQUEST

A. Base Bid #1: Hutchinson Elementary School Roof Repair
   a. Removal of all metal flashings.
   b. Removal of existing built-up roof and composition shingle roof systems.
   c. Repair of damaged existing structural sheathing and framing system.
   d. Repair of damage concrete parapet side walls over building entry.
   e. Temporary removal of mechanical ductwork.
   f. Removal of existing gutter system and reinstallation of the new gutter/downspout system with splash block at bottom of downspouts.
   g. Removal of damage wood fascia trim behind existing gutters and installation of new trim to match existing.
   h. Installation of new PVC single ply membrane, vapor barrier, and cover board.
   i. Installation of new composition shingle on steep sloped portion of the roof area.
   j. Installation of new parapet cap flashing above the building entry and rear mechanical room.
   k. Reinstallation of all temporary removed electrical and mechanical items.
   l. Disposal of debris

B. The General Contractor shall obtain and pay for all Building Permits and Fees, including Subcontractor Permits.

1.4 PUBLIC WORKS

A. Contractor must be registered with the Oregon Construction Contractors Board (CCB) for a quote to be considered.
B. If bid exceeds $50,000, this project is subject to prevailing wage requirements as listed in ORS 279.800 to 279.870. In accordance with ORS 279.830, the minimum hourly rates of wage as determined by the Commissioner of the Bureau of Labor and Industry (BOLI) are hereby made a part of this Project Manual.

1.5 HOURS OF LABOR

A. Section 279C.520, Oregon Revised Statutes, provides that in all cases where labor is employed by the state, county, school district, municipality, municipal corporation or subdivision, through a Contractor, no person shall be required or permitted to labor more than 10 hours in any one day, nor more than 40 hours in any one week, except in the case of necessity, emergency, or where

the public policy absolutely requires it, in which event the person or persons so employed for excessive hours shall receive at least time and one-half pay for all overtime in excess of 10 hours per day or 40 hours in any one week, and for work performed.

B. Hours of labor shall comply with local noise ordinance.

1.6 BIDDER'S REPRESENTATION

A. Each contractor by submitting a quote represents that he or she has read and understands the Project Documents, and has familiarized himself or herself with the locale, site and conditions under which his work is to be performed. The Contractor's signature on his or her quote indicates acceptance of the conditions at the site of the work upon which he or she is bidding.

1.7 SUBMISSION OF BID

A. All bids must be prepared on the Bid Form in this solicitation and submitted in accordance with the Instructions to Bidders. A bid is invalid if it has not been deposited at the designated location prior to the time and date for receipt of bids indicated in the Advertisement to Bid, or prior to any extension thereof issued to the bidders.

B. Unless otherwise provided in any supplement to these Instructions to Bidders, no bidder shall modify, withdraw, or cancel his or her bid or any part thereof for 30 days after the time designated for the receipt of bids in the Advertisement to Bid. Prior to the receipt of bids, Addenda will be mailed or delivered to each Contractor recorded by the Architect as having received the Bid Documents and will be available for inspection wherever the Bid Documents are kept available for that purpose. Enclose the bid with attachments in a sealed envelope with the following address and identification on the face:
    a. [Bidder's Name]
    b. [Bidder's Address]
    c. “UNION SCHOOL DISTRICT – HUTCHINSON ELEMENTARY SCHOOL ROOF REPAIR”

1.8 BID GUARANTEE

A. If the bid exceeds $100,000, attach bid security in the form of a surety bond, cashier's check, or certified check of the bidder in the amount equal to ten percent (10%) of the Basic Bid amount made payable to Union School District #5 as a guarantee that bidder will, if awarded the Contract, execute same and furnish the specified performance and labor and materials payment bond.

B. The Owner reserves the right to hold the bid security of the two lowest bidders until a Contract is signed, or for 30 calendar days, whichever is less. All other bid security will be returned as soon as practical. Any bidder refusing to enter into a Contract and furnish specified bonds within five calendar days after notification that his bid has been accepted, shall forfeit his bid security to the Owner as liquidated damage, but not as a penalty.

1.9 METHOD OF AWARD

A. If the lowest basic bid by a responsible bidder does not exceed the amount of funds estimated by the Owner as available to finance the contract, the contract may be awarded on the base bid, but the Owner shall have sole discretion in also considering the beginning and completion time of the project in rejecting any base bid.

B. At Owner’s discretion, Owner may include one or more bid alternates (additive or deductive) as selected by Owner when comparing bids.

C. The Owner reserves the right to reject any or all bids as permitted by Oregon Statute or Administrative Rule and to consider the competency and responsibility of bidders and of their proposed subcontractors in making the award.

1.10 FORM OF AGREEMENT

A. The "Standard Form of Agreement Between Owner and Contractor," AIA Document A104-2017, shall be used in executing this Contract.

B. If the contract amount exceeds $50,000, the contract shall contain a provision that the contractor pay and perform according to the conditions required by ORS 279C.800 to 279C.870, Prevailing Wage Rate.

1.11 PERFORMANCE BOND

A. If the bid exceeds $100,000, the successful bidder shall promptly furnish a Performance Bond, which shall be an Oregon Public Works Contract Bond, in compliance with the requirements of Chapter 279C.380, Oregon Revised Statutes, in an amount equal to 100 percent of the cost of the work, such bond to be written by properly qualified surety authorized to do business in the State of Oregon.

1.12 PROHIBITIONS OF ALTERATIONS (BID FORM)

A. Except as otherwise provided herein, bids that are incomplete or are conditioned in any way, contain erasures, alterations, or items not called for in the bid, or are not in conformity with the law, may be rejected by the Owner as informal. Only the amounts and information asked for in the Bid Form will be considered as the Bid. Each bidder shall bid upon the work exactly as specified and as provided in the Bid Form.

1.13 LIST OF SUBCONTRACTORS

A. Within two working hours of the date and time of the deadline when the bids were due to the public contracting agency for a public improvement, a bidder shall submit to the public contracting agency, in accordance with ORS 279C.370, a disclosure of any first-tier subcontractor that will be furnishing labor or materials in connection with the public improvement and whose contract value is equal to or greater than:
    a. Five percent of the total project bid or $15,000, whichever is larger; or
    b. $350,000, regardless of the percentage of the total project bid.

B. The disclosure of first-tier subcontractors shall include:
    a. The name of each subcontractor.
    b. The amount of the contract of the subcontractor and the category of the subcontractors work.

C. Submit list of subcontractors on First-Tier Subcontractor Disclosure Form, sealed in an opaque envelope, addressed and delivered to the same location as the Bid.

1.14 SCHEDULE OF VALUES

A. Upon request by the Owner, the selected bidder shall within seven days thereafter, submit to the Architect a Schedule of Values of various parts of the work, including quantities and amount aggregating the total sum of the Contract. With each application for payment, the Contractor shall furnish a detailed statement comprising various items which represent the total amount of work completed to the date upon which application for payment is made. No application for payment will be considered unless accompanied by such a statement.

1.15 EQUAL EMPLOYMENT COMPLIANCE REQUIREMENT

A. By submitting this bid, the bidder certifies conformance with the applicable Federal Acts, Executive Orders, and Oregon Statutes and Regulations concerning Affirmative Action toward equal employment opportunities. All information and reports required by the Federal or Oregon governments having responsibility for the enforcement of such laws shall be supplied to the Owner upon request, for purposes of investigation to ascertain compliance with such acts, regulations, and orders.

1.16 RESIDENCY

1. A. Bidders must identify whether the Bidder is or is not a "resident Bidder," as defined in ORS 279A.120(1).
2. Nonresident Bidders. In determining the lowest Responsive Bid, the District will, in accordance with OAR 137-046-0310, add a percentage increase to the Bid of a nonresident Bidder equal to the percentage, if any, of the preference given to that Bidder in the state in which the Bidder resides.

PART 2 SCHEDULES

2.1 CRITICAL DATES

A. Work to be conducted under one phase as noted below.

B. Contractor must agree to commence work as directed in written 'Notice to Proceed' and shall be substantially complete in accordance with the following schedule:
    a. Preparatory work may begin on date of Notice to Proceed. Preparatory work includes but is not limited to submittals, field verification, exploratory work, equipment procurement, scheduling, and any work not impacting school operations.
    b. Primary construction operations may begin on Monday, June 8, 2020.
    c. All roofing and cleaning shall achieve substantial completion by Friday, August 7, 2020.
    d. All work shall achieve final completion by Friday, August 14, 2020.

C. It is the intent of the Owner to issue a ‘Notice to Proceed’ for the work on or about April 9, 2020.

D. Substitution Requests will be submitted no later than 2 pm, Tuesday, March 24, 2020.
    a. Substitution Requests are to be emailed to the following:
    Eric Hoff at; erich@swh2o.com

2.2 LIQUIDATED DAMAGES

A. If Substantial Completion is not achieved by the agreed date or as may be adjusted pursuant to the Contract Documents, the Contractor shall pay to the Owner as liquidated damages for the loss of use of the Project the following amount: the sum of Three Hundred Dollars ($300) for each partial day or full day of delay beyond the deadline for Substantial Completion.

END OF SECTION

BID FORM

TO: Union School District #5

FROM: _____
(Name of Contractor)

1.1 BID AMOUNT

A. Base Bid #1: Hutchinson Elementary School Roof Repair
   a. Removal of all metal flashings.
   b. Removal of existing built-up roof and composition shingle roof systems.
   c. Repair of damaged existing structural sheathing and framing system.
   d. Repair of damage concrete parapet side walls over building entry.
   e. Temporary removal of mechanical ductwork.
   f. Removal of existing gutter system and reinstallation of the new gutter/downspout system with splash block at bottom of downspouts.
   g. Removal of damage wood fascia trim behind existing gutters and installation of new trim to match existing.
   h. Installation of new PVC single ply membrane, vapor barrier, and cover board.
   i. Installation of new composition shingle on steep sloped portion of the roof area.
   j. Installation of new parapet cap flashing above the building entry and rear mechanical room.
   k. Reinstallation of all temporary removed electrical and mechanical items.
   l. Disposal of debris

   Stipulated Sum

   $_____dollars.

1.2 ALTERNATES:

A. Unit Pricing:

   Plywood Sheathing: _____dollars per SF of 5/8" plywood sheathing.

B. Roof Access Hatch:

   Access Hatch: _____dollars for Acudor Ladder Access Roof Hatch Model #G4444.

1.3 PREVAILING WAGE:

If my bid exceeds $50,000, I certify that my bid includes prevailing wage requirements as listed in ORS 279.800 to 279.870.

Initial Here:_____

1.4 COMPANY SIGNATURE AND IDENTIFICATION

Please print or type all information requested below (except where signature is required) and attach Bid Security to this form.

Name of Proprietorship, Partnership, or Corporation:

_____
Name

_____
Street Address

_____
Mailing Address

_____
City, State, and Zip Code

_____
Phone Number

_____
Employer ID Number

_____
Construction Contractors Board Number

Signature of Proprietor, Partner, or Corporate Official:

_____
Signature

_____
Name of Signatory

_____
Date Signed

_____
If Corporation, Attest:

_____
Secretary of Corporation

_____
State of Incorporation

END OF FORM

1.1 GENERAL

A. Standard Form of Agreement between Owner and Contractor for Construction, AIA Document A104-2017, is included in this Project Manual by reference as though bound herein and will be the form of Contract for the Work.

1. A Copy of the Agreement Form is on file at the Architect's office and may be examined during normal working hours.

END OF DOCUMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Scope of work.
2. Type of Contract.
3. Work of Other Contracts.
4. Use of premises.
5. Work restrictions.
6. Specification formats and conventions.

1.2 SCOPE OF WORK

A. Project Identification: Union School District – Hutchinson Elementary School Roof Repair Project.

1. Project Location: 540 S Main Street, Union, Oregon 97883

B. Owner: Union School District #5

C. Architect: Hoff Architecture, LLC / Structural Waterproofing Consultants, LLC, 9450 SW Commerce Circle, Suite 410, Wilsonville, Oregon 97070.

1. Contract Documents prepared for the Project by Hoff Architecture are dated February 25, 2020.

D. The Work of the Contract consists of re-roof of the existing elementary school roof systems, which includes removal of the existing roof membranes and installation of a new roof membrane systems, including removal / replacement existing flashings and repair of water damaged sheathing, trim and structural elements as indicated in the Drawings and as specified in this Project Manual, including Modifications incorporated into the Contract Documents

1. 2014 State of Oregon Structural Specialty Code applies to Work of this Contract.

1.3 TYPE OF CONTRACT

A. Project will be constructed under a single prime contract.

1.4 WORK UNDER OTHER CONTRACTS

A. Preceding Work:

1. Owner has or will award separate contract(s) for the following operations at Project site prior to start of this Contract. Those operations are scheduled to be substantially complete before work under this Contract begins:

a. Assessment of existing condition of the roof membrane and underlying structural, including whether there are hazardous materials present.

C. If Work of other contractors in any way interferes with the Contractor's Work, notify party sufficiently in advance to give reasonable time to make necessary adjustments.

D. If the Contractor's Work in any way interferes with the work of other contractors, notify other party and Owner as soon as possible and modify schedule to accommodate the other party's work, or make other arrangements to accommodate other contractors work as agreed to by Owner.

E. Contractor recognizes that Owner is entitled, under the Contract Documents, to perform Work on site during the course of Contractor's performance, whether by Owner's forces, consultants, or separate contractors.

1.5 USE OF PREMISES

A. General: Contractor shall confine construction operations, including storage of materials and equipment, to on-site areas coordinated with the Owner, or at additional off-site location(s).

1. Provide a construction staging plan prior to start of construction for acceptance by Owner.

a. Use of Owner's property outside designated staging areas will not be permitted except for limited periods of time as approved by Owner.
b. When necessary and when directed by Owner, move stored products that interfere with Owner’s operations.

2. Obtain and pay for necessary additional off-site storage or staging areas.

B. Owner reserves right to perform work or to retain other Contractors on portions of Project.

C. Maintain clear access to project at all times for emergency vehicles, delivery of materials, and Owner and Owner’s employee access.

D. Contractor shall make arrangements with city and county agencies for use of public property for construction purposes and pay all fees required for such use.

E. Contractor is responsible for necessary cleaning and repair of adjacent streets resulting from Contractor's operations.

F. Use of Existing Building:

1. Maintain existing building in a weather tight condition throughout the construction period.
2. Allow for Owner occupancy.

a. Cooperate with Owner to minimize conflict, and to facilitate Owner’s operations.
b. Schedule Work to accommodate this requirement.

3. Repair damage caused by construction operations.

1.6 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be generally performed inside, on outside, and in close proximity to the existing building during normal business working hours of 7:00 AM to 5:00 PM, Monday through Friday, except as otherwise indicated.

1. Weekend Hours: To be determined as agreed upon between Owner and Contractor, depending on necessity.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner and others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

C. 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 working days in advance of proposed disruptive operations.
2. Do not proceed with disruptive operations without Owner's written permission.

1.7 SPECIFICATION FORMAT AND CONVENTIONS

A. Specification Format: Specifications are organized into Divisions and Sections using the 50 Division format and The Construction Specifications Institute's (CSI) "Master Format" 2016 Edition numbering system.

1. Division 01 - General Requirements: Sections in this Division govern the execution of Work of all Specifications Sections.

B. 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, as follows:

1. Abbreviated Language:

a. Language used in the Specifications and other Contract Documents is abbreviated.
b. Words and meanings shall be interpreted as appropriate.
c. Words implied, but not stated, shall be inferred as the sense requires.
d. Singular words shall be interpreted as plural, and plural words as singular, where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications.

a. Requirements expressed in the imperative mood are to be preformed by Contractor.
b. Subjective or indicative language may be used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
c. 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.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

B. Related Sections:

1. Section 01 26 00: Contract Modification Procedures, for procedures for submitting and handling Change Orders.
2. Section 01 45 00: Quality Control, for general testing and inspecting requirements.

1.2 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if the estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, profit, and applicable taxes.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this work measured, at the Owner's expense, by an independent surveyor acceptable to the Contractor.

D. Unit Price Schedule: A schedule of unit prices is included in Part 3 of this Section. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 UNIT PRICE SCHEDULE

A. Unit Price: Plywood Wall Sheathing:

1. Description: Removal of moisture damaged ¾ inch plywood roof sheathing and replacement with new plywood wall sheathing specified in Section 06 16 00, “Sheathing.”

2. Unit of Measurement: Square feet area of plywood removed and installed.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Alternates.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on Bid Form for certain work defined in Bidding Requirements that may be added to or deducted from Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

A. Owner reserves right to select any or all of alternates up to thirty calendar days after award of Contract, unless otherwise stated in Bidding Requirements.

B. Coordination: Modify or adjust of affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not described as part of alternate.

C. Notification: Immediately following award of the Contract, notify in writing each party involved of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

D. Execute accepted alternates under same conditions as other Work of the Contract.

E. Schedule: A Schedule of Alternates is included at the end of this Section. Drawings, and Specification Sections referenced in the schedule, contain requirements and materials necessary to achieve the work described under each alternate.

PART 2 PRODUCTS (not applicable)

PART 3 EXECUTION

3.1 SCHEDULE OF ALTERNATES

END OF SECTION

SUBSTITUTION REQUEST

Union School District #5
Hutchinson Elementary School Roof Repair

TO: Structural Waterproofing Consultants LLC
9450 SW Commerce Circle, Suite 410
Wilsonville, Oregon 97070
Attn: Eric Hoff
Phone: 503-329-2455 Email: erich@swh2o.com

SPECIFIED ITEM: _____

Section	**Page**	**Paragraph**	**Description**

PROPOSED SUBSTITUTION: _____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of request including identifying applicable data portions.

Attached data also includes description of changes to Contract Documents and proposed substitution required for its proper installation.

Undersigned certifies following items, unless modified by attachments, are correct:

1. Proposed substitution does not affect dimensions shown on drawings.
2. Undersigned pays for changes to building design, including engineering design, detailing, and construction costs caused by proposed substitution.
3. Proposed substitution has no adverse effect on other trades, construction schedule, or specified warranty requirements.
4. Maintenance and service parts available locally or readily obtainable for proposed substitution.

Undersigned further certifies function, appearance, and quality of proposed substitution are equivalent or superior to specified item.

Undersigned agrees, if this page is reproduced, terms and conditions for substitutions found in Bidding Documents apply to this proposed substitution.

Submitted by:

_____
Name (printed or typed)

_____
Signature

_____
Firm Name

_____
Address

_____
City, State, Zip

_____
Date

_____
Telephone Fax

_____
General Contractor (if after award of Contract)

For Use by Architect Only

__Approved __Approved as Noted
__Not Approved __Received Too Late

By _____
Date _____
Remarks _____

If After Award of Contract:
Reason for Substitution Request: _____

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes procedures for the following:

1. Contractor's responsibilities concerning substitutions.
2. Substitutions requests during the bidding period.
3. Substitutions requests after award of Contract.
4. Substitutions not permitted.

B. Related Sections:

1. Section 01 42 00: Definitions and Reference Standards, for applicability of industry standards to products specified.
2. Section 01 60 00: Product Requirements, for requirements governing Contractor's selection of products and product options.

1.2 DEFINITIONS

A. Substitutions: Contractor proposals for changes in products, materials, equipment, and methods of construction required by the Contract Documents made during bidding and after award of Contract are considered to be requests for substitution.

1. The following are not considered to be requests for substitution:

a. Revisions to the Contract Documents requested by Owner or Architect.
b. Specified options of products and construction methods included in the Contract Documents.
c. Contractor's determination of and compliance with regulations and orders issued by governing authorities.

B. Substitutions accepted during the bidding period are accepted by Addendum prior to award of Contract, and thereafter are included in the Contract Documents.

C. Substitutions requested and accepted after award of contract are accepted only by Change Order, and thereafter are included in the Contract Documents.

1.3 CONTRACTOR'S RESPONSIBILITIES

A. Contractor's responsibilities for substitution requests made after award of Contract are as follows:

1. Investigate proposed products and determine they are equal or superior in all respects to products specified.
2. Provide same guarantee for accepted substitutions as for products specified.
3. Make changes in, and coordinate, the Work as may be required to incorporate and install accepted substitutions.
4. Waive all claims for additional costs that subsequently become apparent which are related to substitutions.

1.4 SUBSTITUTION SUBMITTAL PROCEDURES

A. Acceptability of different materials or products shall be determined by methods set forth in this Section.

B. Architect will be sole judge of acceptability of any proposed substitution, and decision of Architect will be final.

PART 2 PRODUCTS

2.1 SUBSTITUTION REQUIREMENTS DURING THE BIDDING PERIOD

A. Submit request for approval of a substitution on Structural Waterproofing Consultants LLC Substitution Request Form; Copy included at the end of this Section.

B. All substitution requests must be received in the Architect's office no less than 10 working days prior to Bid Date, unless otherwise stipulated in the Instructions to Bidders.

2.2 SUBSTITUTIONS REQUESTED AFTER AWARD OF CONTRACT

A. Substitutions will normally not be considered after award of Contract, except due to unforeseen circumstances.

B. Architect will receive and consider Contractor's request for substitution after award of Contract when one or more of the following conditions are satisfied, as determined by the Architect. If the following conditions are not met, Architect will return the requests without action except to record noncompliance with these requirements.

1. The specified product cannot be provided within the Contract time.

    a. Architect will not consider the request if the product cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

2. The specified product cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
3. The specified product cannot be coordinated with other materials and the Contractor certifies that the proposed substitution can be coordinated.
4. The specified product cannot provide the required warranty and the Contractor certifies that the proposed substitution provides the warranty.
5. The requested substitution offers the Owner a substantial advantage in cost, time, or other considerations after deducting additional Owner's cost of compensation to the Architect for redesign and evaluation services, increased cost of other construction, and similar considerations.

C. Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

2.3 SUBSTITUTIONS NOT PERMITTED

A. Substitutions indicated or implied on submitted Shop Drawings or Product Data without first requesting approval in accordance with requirements of this Section.

B. Where manufacturers, products, or systems listed in the Specifications are not followed with "or approved" or "Substitutions: Provide in accordance with requirements of Section 01 25 00," it is intended that substitutions are not permitted.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing the following Contract modifications:

1. Requests for Interpretation.
2. Architect's Supplemental Instructions.
3. Proposal Requests.
4. Construction Change Directives.
5. Change Orders.

B. Related Documents and Sections:

1. Document 00 72 00: General Conditions.
2. Section 01 22 00: Unit Prices, for administrative requirements for using unit prices.
3. Section 01 25 00: Substitution Procedures, for administrative procedures for handling request for substitutions made after Contract award.
4. Section 01 77 00: Closeout Procedures, for requirements for inclusion of contract modifications in record documents.

1.2 RESPONSIBLE PARTIES

A. Immediately following Contract execution, Owner and Contractor to identify each person who is responsible for executing Change Orders and other modifications to the Contract.

1.3 DEFINITIONS

A. Request for Interpretation (RFI):

1. Written request submitted by Contractor to Architect on standard form requesting interpretation of Contract documents.
2. An RFI shall only be used as a vehicle for confirming or verifying an issue through an interpretation of the Contract Documents; responses that result in change to Contract Documents and adjustment to Contract Sum and/or Contract Time must be documented in a Change Order.

B. Architect's Supplemental Instructions (ASI):

1. Architect's written order of instruction to Contractor, signed by Architect, that authorizes minor changes in Work that do not change Contract Sum or Contract Time.

C. Proposal Request (PR):

1. Initiated by Architect: Written request by Architect to Contractor to quote change to Contract Sum and/or Contract Time for proposed change to Contract Documents.
2. Initiated by Contractor: Written request by Contractor to Architect proposing change to Contract Documents accompanied with quotation for change to Contract Sum and/or Contract Time.

D. Construction Change Directive (CCD):

1. Written order prepared by Architect, signed by Owner and Architect, directing Contractor to proceed with change to Contract Documents which affect Contract Sum and/or Contract Time, for subsequent inclusion in a Change Order after change to Contract Sum and/or Contract Time has been determined.

E. Change Order (CO):

1. Prepared by Architect and signed by Owner, Contractor, and Architect stating their agreement to a change to Contract Documents and adjustment to Contract Sum and/or Contract Time.

1.4 REQUEST FOR INTERPRETATION (RFI):

A. Submit RFIs numbered in sequential order, reviewed by Contractor with respect to Construction Documents, with the following information:

1. Project name and address.
2. Architects name.
3. Contractors name.
4. Date of RFI.
5. Drawing and/or Specification reference.
6. Signature of Contractor's reviewer.
7. Indicate "URGENT" on RFIs that may cause impact to the project schedule.

B. Architect will receive RFIs only from the Contractor; Architect will not accept RFIs directly from subcontractors, suppliers, or other entities.

C. Architect will receive only legible, properly prepared RFIs.

1. Unreadable facsimile machine RFIs, illegibly written RFIs, or RFIs with incomplete information, will be returned promptly without action.
2. RFIs may be transmitted to Architect by facsimile machine.

a. Architect will return response by same method received from Contractor.

3. Architect will review RFIs with respect to Contract Documents and return response within 7 calendar days.

a. RFIs marked "URGENT" will take precedence, in order received, over outstanding RFIs and be answered by Architect as soon as possible.

D. Contractor, in being fully familiar with Construction Documents, shall not be relieved of responsibility to coordinate the Work to prevent adverse impact to Project schedule when submitting RFIs to Architect for interpretation of Contract Documents.

1.5 ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS (ASI)

A. Architect's Supplemental Instructions may include supplementary or revised Drawings and/or Specifications to describe minor changes to Contract Documents.

B. Architect's Supplemental Instructions will be executed on AIA Form G710, or other similar form designated by Architect.

1.6 PROPOSAL REQUEST (PR)

A. Proposal Request Initiated by Architect:

1. Proposal Request is a request for information only and is not an instruction or authorization to execute the change, or an order to stop Work in progress.
2. Proposal Request may include supplementary or revised Drawings and/or Specifications to describe a proposed change to Contract Documents.
3. Contractor shall submit cost and/or time quotations to Architect within 10 working days following receipt of Proposal Request.

B. Proposal Request Initiated by Contractor:

1. Proposal Request is for a change in the Work accompanied by a detailed quotation of impact on Contract Sum and/or Contract Time.
2. Proposal Request may include revised Drawings and/or Specifications to describe a proposed change to Contract Documents.
3. Proposal Request is a request for information only and does not authorize the Contractor to execute the change or stop Work in progress without the Architect's and Owner's authorization.
4. Contractor initiated Proposal Requests may take the form of a "Claim" where Contractor finds it necessary for proper execution of the Work, to propose a change in the Work that is not shown or indicated in Contract Documents, and may affect Contract Sum and/or Contract Time, which for which no Proposal Request or Construction Change Authorization has been issued by the Architect.

    a. Contractor's determination that Architect's response to an RFI that affects Contract Sum and/or Contract Time may be addressed in a Proposal Request.

5. Architect shall respond to Contractor initiated proposals within 10 working days following receipt of Proposal Request.

1.7 CONSTRUCTION CHANGE DIRECTIVE (CCD)

A. A Construction Change Directive is issued in lieu of a Proposal Request when time is of the essence and change to Contract Sum and/or Contract Time cannot be determined prior to start of the work.

B. A Construction Change Directive is executed on AIA Form G714 or other similar form designated by Architect and may include supplementary or revised Drawings and/or Specifications to describe change to the Contract Documents.

C. Both Owner and Architect will sign and date a Construction Change Directive that directs the Contractor to proceed with change to the Contract Documents prior to determination of cost and/or time.

D. Contractor shall submit to Architect itemized change to Contract Sum and/or Contract Time within 10 working days when possible, and no more than 30 calendar days, except for the following conditions:

1. Unit prices have been agreed upon and quantities cannot be determined until work described in the CCD has been completed.
2. Owner has agreed that Contract Sum and/or Contract Time of can be determined at completion of work described in the CCD.

E. When Owner, Architect, and Contractor concur on change to Contract Sum and/or Contract Time, as described in the General Conditions for “Construction Change Directives,” the change to Contract Sum and/or Contract Time will be included in a Change Order.

1.8 CHANGE ORDERS

A. Architect will prepare each Change Order utilizing AIA Document G701, or other similar form acceptable to Owner.

B. Changes to Project Contract Sum and/or Contract Time listed or indicated in Change Orders shall include or be determined by methods described in the General Conditions, and as follows:

1. Proposal Requests approved for change to Contract Documents by Owner and Architect that have not been converted to a Construction Change Directive.
2. Construction Change Directives where Owner, Architect, and Contractor have agreed to change in Project Contract Sum and/or Contract Time.
3. Changes to Project Contract Sum and/or Contract Time that have not been documented by Proposal Request or Construction Change Directive, but have been agreed upon by Owner, Architect, and Contractor.

1.9 DOCUMENTATION FOR CONTRACT MODIFICATIONS

A. Cost and Time Quotations: Support quotation for changes in the Work with sufficient substantiating data to allow Architect to evaluate quotation, to include the following:

1. Labor expended in hours and unit cost.
2. Equipment cost.
3. Products, with quantities used and unit cost, including purchase source.
4. Taxes, Insurance, and Bonds.
5. Credit for deleted work where applicable with same documentation as required for cost increases for additional work.
6. Overhead and profit, determined after credits have been deducted from additions.
7. Justification for change in Contract Time.

B. For claims for Work not authorized through Proposal Requests or Construction Change Directives, provide supporting documentation for each claim for additional cost as indicated above for cost and time quotations with the following additional information:

1. Name of Owner’s authorized agent who ordered work, and date of Order.
2. Dates and hours work performed, and by whom.
3. Timecard records, including summary of hours worked, and hourly rates paid.
4. Receipts and invoices for products used including quantities and unit costs.
5. Receipts and invoices for equipment utilized, including dates and time of use.
6. Provide the same documentation indicated above for subcontracts same as required for Contractor’s own forces.

C. Document requests for Product substitutions according to requirements of Section 01 25 00.

1.10 CORRELATING CHANGE ORDERS WITH OTHER REQUIREMENTS

A. Revise Schedule of Values and Applications for Payment to record each Change Order as separate item of work with adjustment to Contract Sum and Contract Time as described in Section 01 29 00, “Payment Procedures.”

B. Revise Construction Schedule to reflect each change in Contract Time.

C. Revise Sub-schedules to show changes for other items of work affected by modifications to Contract Documents.

D. Record modifications in Record Documents.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections:

1. Section 01 22 00: Unit Prices, for requirements governing using unit prices.
2. Section 01 26 00: Contract Modification Procedures, for administrative procedures for handling changes to the Contract.

1.2 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:

a. Application for Payment forms with Continuation Sheets.
b. List of Subcontractors, principle suppliers, and fabricators.
c. Submittals Schedule.
d. Items required to be indicated as separate activities in Contractor's Construction Schedule.

2. Submit the Schedule of Values to Architect at earliest possible date but no later than 7 days before date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one-line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of the Architect.
c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Arrange Schedule of Values consistent with format of AIA Document G703.
3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

a. Related Specification Section or Division.
b. Description of the Work.
c. Name of subcontractor.
d. Name of manufacturer or fabricator.
e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value.

1) Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

4. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
5. Round amounts to nearest whole dollar; the total to equal the Contract Sum.
6. Provide a separate line item for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.

   a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing for items stored off-site.

7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items or distributed as general overhead expense, at Contractor's option.

8. Update and resubmit the Schedule of Values before the next Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

   1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment date is as agreed to by the Owner and the Contractor. The period of construction Work covered by each Application for Payment is the period indicated in that Agreement.

   1. Comply with Section 60, chapter 675, Oregon Laws for projects in the State of Oregon:

      a. Progress payments must be made on the basis of certified billing or estimate of the work during the preceding 30-day billing cycle, unless notice of an alternate billing cycle is stated on each page of Drawings and Specifications in accordance with Oregon law.
      b. The Owner shall make progress payments to the Contractor within 14 days after the date the billing is submitted, unless notice of allowance for payments to be made later than 14 days is stated on each page of Drawings and Specifications in accordance with Oregon law.
      c. A billing or estimate is deemed to be certified 10 days after the Owner or Architect receives the billing or estimate, unless the Owner or Architect issues a written statement detailing those items not approved, as allowed for by Oregon law. The Owner may extend the period within which the billing or

estimate may be certified if such extended period is stated on each page of Drawings and Specifications in accordance with Oregon law.

C. Payment Application Forms: Use AIA Document G702 and Continuation Sheets G703.

D. Application Preparation: Complete every item of form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Match entries with data on the Schedules of Values.
2. Include amounts for Work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for Work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit 3 signed and notarized original copies of each application for payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

F. Waivers of Mechanic Lien: With each Application for Payment, submit waivers of mechanic's lien from subcontractors, sub-subcontractor, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for the amount requested in previous applications, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule.
4. Products list
5. Submittals Schedule.
6. List of Contractor's staff assignments.
7. List of Contractor's principal consultants.
8. Copies of building permits.
9. Initial progress report.
10. Report of preconstruction conference.
11. Certificates of insurance and insurance policies.
12. Performance and payment bonds.
13. Data needed to acquire the Owner's insurance.

H. Application for Payment at Substantial Completion: After issuance of the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
3. Administrative actions and submittals that must precede or coincide with this application include the following:

    a. Occupancy permits and similar approvals.
    b. Warranties (guarantees) and maintenance agreements.
    c. Test/adjust/balance records.
    d. Maintenance instructions.
    e. Final cleaning.
    f. Application for reduction of retainage and consent of surety.
    g. Advice on shifting insurance coverages.
    h. List of incomplete Work recognized as exceptions to Architect's Certificate of Substantial Completion.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. Evidence that claims have been settled.
5. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
6. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
7. Assurance that incomplete Work not accepted, if applicable, will be completed without undue delay.
8. Evidence that taxes, fees, and similar obligations were paid.
9. Removal of temporary facilities and services.
10. Removal of surplus materials, rubbish, and similar elements.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General Project coordination procedures.
2. Project meetings.
3. Construction schedule.
4. Submittal schedule.
5. Field Engineering.

B. Related Sections:

1. Section 01 60 00: Product Requirements, for coordinating selection of products.
2. Section 01 74 00: Cleaning, for coordinating progress and final cleaning.
3. Section 01 77 00: Closeout Procedures, for coordinating Contract closeout requirements.

1.2 COORDINATION

A. Coordinate construction operations included in various Specification Sections to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Coordinate storage or staging areas for all trades.

B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate Contractors if coordination of their Work is required.

C. Administrative Procedures:

1. Coordinate scheduling and timing of required administrative procedures with other construction activities, activities of the Owner, and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

a. Preparation of Contractor’s construction Schedule.
b. Preparation of the Schedule of Values.
c. Installation and removal of temporary facilities and controls.
d. Delivery and processing of submittals.
e. Progress meetings.
f. Preinstallation conferences.
g. Startup and adjustment of systems.

h. Project closeout activities.

D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

E. Coordination of Key Personnel: Within 15 days of commencement of construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site.

1. Identify individuals, their duties and responsibilities.
2. List addresses and telephone numbers, including home and office telephone numbers.
3. Post copies of list in Project meeting room, and temporary field office. Keep list current at all times.

1.3 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute agenda to all invited attendees.
3. Minutes: Record significant discussions, and agreements achieved. Distribute meeting minutes to everyone concerned, including Owner and Architect, within 72 hours after each meeting.

B. Preconstruction Conference:

1. Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but not later than 15 days after execution of Agreement.

a. Hold conference at Project site or other location agreeable to Owner and Architect.
b. Conduct meeting to review responsibilities and personnel assignments.

2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties deemed necessary.
3. All participants shall be familiar with Project and authorized to conclude matters relating to the Work.
4. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing and long-lead items.
d. Designation of key personnel and their duties.
e. Routing of correspondence.
f. Distribution of Contract Documents.
g. Procedures for processing field decisions and Change Orders.
h. Procedures for requests for interpretations (RFIs).
i. Submittal procedures and mockups.

j. Procedures for testing and inspection.
k. Procedures for processing Applications for Payment.
l. Procedures for substitutions.
m. Responsibility for temporary facilities and controls.
n. Use of premises and Owner's Utilities.
o. Work restrictions.
p. Site access, traffic, and parking availability and rules.
q. Office, work, and storage areas.
r. Security.
s. Progress cleaning.
t. Construction waste management and recycling.
u. Owner's occupancy requirements.
v. Closeout Procedures.

5. Minutes: Contractor will record and distribute meeting minutes.

C. Preinstallation Conferences:

1. Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
2. Attendees: Contractor and its superintendent, installer and representatives of manufacturer and fabricator involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow. Include code enforcement personnel if required by local codes.
3. Advise Architect of scheduled meeting dates.
4. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. The Contract Documents.
b. Related Change Orders.
c. Related Requests for Interpretation (RFI's).
d. Submittals.
e. Review of mockups.
f. Possible conflicts or compatibility problems.
g. Time schedules.
h. Weather limitations.
i. Manufacturer's written recommendations.
j. Warranty requirements.
k. Acceptability of substrates.
l. Temporary Facilities and Controls.
m. Regulations of authorities having jurisdiction.
n. Testing and inspecting requirements.
o. Installation procedures.
p. Coordination with other work.
q. Protection of adjacent work.

5. Record significant conference discussions, agreements, disagreements, disagreements, and required corrective measures and actions.
6. Do not proceed with installation if conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene conference at earliest feasible date.
7. Minutes: Contractor will record and distribute meeting minutes to each party present and to parties who should have been present.

D. Progress Meetings:

1. Conduct progress meetings at Project site at regular scheduled intervals.

   a. Coordinate meeting dates with preparation of payment request.

2. Attendees: Authorized representatives of Owner, Architect, Contractor, and each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of immediate future activities.

   a. Participants shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that affect progress, including topics for discussion as appropriate to status of Project.

   a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
   b. Review schedule for next period.
   c. Review present and future needs of each entity present, including the following:

      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Progress cleaning.
      5) Quality and Work standards.
      6) Status of correction of deficient items.
      7) Field observations.
      8) Requests for interpretation (RFIs) status.
      9) Status of Proposal Requests.
      10) Status of Change Orders.
      11) Project administration issues.

4. Minutes: Contractor will record and distribute meeting minutes to Owner and Architect. Contractor shall be responsible for distribution to subcontractors, suppliers, or other entities concerned with current progress.
5. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit a comprehensive, fully developed, horizontal bar-chart type Contractor's Construction Schedule within 30 days after date established for commencement of Work.

B. Indicate each significant construction activity separately. Identify first working day of each week with a continuous vertical line.

1. Include start-up, finish, duration, slack time, approval dates, material ordering, delivery dates, anticipated shutdowns, partial occupancy and Owner use, Completion Date and other such information required to allow Owner's monitoring of progress of project and identifying critical path of events required to meet Completion Date.
2. Use same breakdown of units of Work as indicated in Schedule of Values.

C. Distribution: Following response to initial submittal, print and distribute copies to Architect, Owner, subcontractors, and other parties required to comply with scheduled dates.

D. Schedule Updating: Revise Contractor’s Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized.

1. Bring significant deviations from Schedule immediately to Owner's and Architect’s attention.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of Work, including Shop Drawings, Product Data, and Samples.

B. Related Sections:

1. Section 01 25 00: Substitution Procedures, for substitutions submittal requirements.
2. Section 01 29 00: Payment Procedures, for Applications for Payment and Schedule of Values submittal requirements.
3. Section 01 31 00: Project Management and Coordination, for Coordination Drawings, Contractor's Construction Schedule, Submittals Schedule, and distribution of meeting and conference minutes submittal requirements.
4. Section 01 45 00: Quality Control, for test and inspection reports submittal requirements.
5. Section 01 77 00: Closeout Procedures, for Record Drawings, Record Specifications, Operation and Maintenance Manuals, and warranties submittal requirements.
6. Sections with specific requirements for submittals indicated in those Sections.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD Drawings of the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals under provisions stated in the General Conditions of the Contract for Construction.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all items required for each specification section concurrently unless partial submittals for portions of the Work are indicated on approved submittals schedule.
3. Submit Action Submittals and Informational Submittals required by the same specification section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed by need to review submittals concurrently for coordination.

    a. Architect reserves right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
    b. Partial submittals may be rejected as not complying with these provisions.

C. Submittals Schedule: Comply with requirements of Section 01 31 00, Project Management and Coordination, for list of submittals and time requirements for scheduled performance of related construction activities.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows.

1. Time for review shall commence on Architect's receipt of submittal.
2. 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.
3. Initial Review: Allow minimum 10 working days for initial review of each submittal.

    a. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

4. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
5. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 15 days for initial review of each submittal.
6. Resubmittal Review: Allow minimum 10 working days for initial review of each submittal.

E. Identification: Place a permanent label or title block on each submittal for identification.

1. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
2. Include the following information on label:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Name of firm or entity that prepared submittal.
    f. Name of manufacturer.
    g. Submittal number, including revision identifier.

        1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g. 06 10 00.01). Resubmittals should include an alphabetic suffix (e.g. 06 10 00.01A).

    h. Number and title of appropriate Specification Section.
    i. Drawing number and detail reference, as appropriate.
    j. Location(s) where product is to be installed, as appropriate.
    k. Other necessary identification.

F. Submit items pertaining to only one Specification Section in each submittal.

G. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

H. Transmittal: Package each submittal individually and appropriately for transmittal and handling.

1. Transmit each submittal from Contractor to Architect using a transmittal form.
2. Architect will return submittals, without review, received from sources other than Contractor or forwarded to Architect without transmittal.

I. Resubmittals:

1. Make resubmittals in same form and number of copies as initial submittal.
2. Note date and content of revision in label or title block of resubmittal. Clearly indicate extent of revision.

J. Distribution:

1. Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others necessary as necessary for performance of construction activities.
2. Indicate submittal distribution on transmittal.

K. Use for Construction: Use only submittals with mark indicating Architect's final release.

L. Submittal Log: Maintain an accurate submittal log for duration of Work, showing current status of submittals at all times. Make log available to Owner and Architect for review upon request.

PART 2 PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

2.2 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction and type of product or equipment.

1. If information must be specifically prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not Product Data.

B. Mark each copy of each submittal to show which products and options are applicable.

1. Product Data, such as general product brochures containing information on other products that are not required or proposed for Work, which are not clearly marked to indicate which products and options are applicable to Project will be returned by Architect without review or action.

C. Include following information, as applicable:

1. Manufacturer's written recommendations.
2. Manufacturer's product specifications.
3. Manufacturer's installation instructions.
4. Standard color charts.
5. Manufacturer's catalog cuts.
6. Compliance with specified referenced standards.
7. Testing by recognized testing agency.
8. Performance characteristics and capacities.
9. Notation of dimensions verified by field measurement.
10. Wiring diagrams showing factory installed wiring.
11. Printed performance curves.
12. Operational range diagrams.
13. Mill reports.

14. Notation of coordination requirements.

D. Colors and Patterns: Except where specific color and pattern is indicated in Contract Documents, and whenever a choice of color or pattern is available in specified products, submit minimum 2 color and pattern charts to Architect for selection.

E. Submit Product Data before or concurrent with Samples.

F. Number of Copies: Submit the following for each required submittal:

1. 2 copies for Architect.
2. Number of copies as required for Maintenance manuals.
3. Number of copies as required by Contractor for distribution.

G. Architect will retain 2 copies and return remainder to Contractor, marked with action taken and, where applicable, corrections or modifications required.

1. Distribute Product Data necessary for performance of construction activities.
2. Retain number of copies required for maintenance manuals.

2.3 SHOP DRAWINGS

A. Shop Drawings: Prepare Project specific information, drawn accurately to a scale sufficiently large to show pertinent aspects of item and its method of connection to Work. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal of Architect's CAD Drawings are permitted.

B. Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

1. Dimensions; Identify dimensions established by field measurement.
2. Identification of products.
3. Fabrication and installation drawings.
4. Roughing-in and setting diagrams.
5. Wiring Diagrams: Differentiate between manufacturer installed and field installed wiring.
6. Shopwork manufacturing instructions.
7. Templates and patterns.
8. Schedules.
9. Design calculations.
10. Compliance with specified standards.
11. Notation of coordination requirements.
12. Relationship to adjoining construction clearly indicated.
13. Seal and signature of professional engineer if specified.

C. Sheet Size: Except for templates, patterns and similar full-size drawings, at least 8-1/2 by 11 inches but no larger than 24 by 36 inches

D. Number of Copies: Submit 3 opaque copies of each submittal.

1. One copy will be returned to Contractor marked with Architect’s action taken and, where applicable, corrections or modifications required.
2. Contractor is responsible for reproduction and distribution of final Shop Drawings as reviewed and necessary for performance of construction activities.

2.4 SAMPLES

A. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of those characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

B. Identification: Attach label on unexposed side of Samples that includes the following:

1. Generic description of Sample.
2. Product name and name of manufacturer.
3. Sample source.
4. Submittal number, and number and title of appropriate Specification Section.

C. Disposition: Maintain sets of approved Samples at Project site, available for quality control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

D. Field Samples: Full-size examples erected on-site to illustrate finishes, coatings, or finish materials and to establish Project standard. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of the Contractor.

E. Samples for Initial Selection: Submit manufacturer's color charts showing the full range of colors, textures, and patterns available.

1. Submit 2 color charts. Architect will return 1 color chart with options selected.

F. Samples for Verification: Submit full size units or Samples of size indicated, prepared from same material to be used in the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected.

1. Samples include, but are not limited to, the following:

a. Partial sections of manufactured or fabricated components.
b. Small cuts or containers of materials.
c. Complete units of repetitively used materials.
d. Swatches showing color, texture, and pattern.
e. Color range sets.
f. Components used for independent testing and inspection.

2. Number or Samples: Submit 3 sets of Samples. Architect will retain 1 sample and return remainder of sets to Contractor.

a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics are to be demonstrated.
b. If variation in color, pattern, or texture, or other characteristic is inherent in material or product represented by a Sample, submit at least 3 sets that show approximate limits of variations, or number of units indicated in individual Specification Sections.

2.5 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by Specification Sections.

1. Number of Copies: 2 copies for Architect, unless otherwise indicated. Architect will not return copies.
2. Certificates and Certifications.

    a. Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an office or other individual authorized to sign documents on behalf of that entity.

3. Test and Inspection Reports: Comply with requirements specified in Section 01 4500, Quality Control.
4. Welding, Installer, Manufacturer, Product and Material Certificates: Prepare written statements on manufacturer's letterhead certifying compliance with requirements in the Contract Documents.

B. The following are Informational Submittals:

1. Test and Inspection Reports.
2. Coordination Drawings.
3. Contractor’s Construction Schedule.
4. Qualification Data.
5. Welding Certificates.
6. Installer Certificates.
7. Manufacturer Certificates.
8. Product Certificates.
9. Material Certificates.
10. Material Test Reports.
11. Research/Evaluation Reports.
12. Compatibility Test Reports.
13. Field Test Reports.
14. Maintenance Data.
15. Design Data.
16. Manufacturer’s Instructions.
17. Manufacturer’s Field Reports
18. Material Safety Data Sheets.

    a. Submit information directly to Owner; do not submit to Architect.
    b. Architect will not review submittals that include MSDSs and will return the entire submittal for resubmittal.

2.6 DELEGATED DESIGN

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.

B. Delegated Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit 3 copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 EXECUTION

3.1 CONTRACTOR'S REVIEW

A. 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.

1. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, mark with an action stamp, and return to Contractor.

C. Action Stamp: Architect will stamp each submittal with an action stamp, and mark stamp appropriately to indicate action taken, as follows:

1. Final Unrestricted Release: When a submittal is marked "NO EXCEPTION TAKEN," Work covered by submittal may proceed provided it complies with requirements of Contract Documents. Final payment depends on that compliance.
2. Final-But-Restricted Release: When a submittal is marked "MAKE CORRECTIONS NOTED," Work covered by submittal may proceed provided it complies with notations or corrections on submittal and requirements of Contract Documents. Final payment depends on that compliance.
3. Returned for Resubmittal: When a submittal is marked "REVISE AND RESUBMIT," do not proceed with Work covered by submittal, including purchasing, fabrication, delivery, or other activity.

a. Revise or prepare a new submittal according to notations and resubmit. Repeat as necessary to obtain an action releasing submittal.
b. Do not use, or allow others to use, submittals marked "REVISE AND RESUBMIT," at Project site or elsewhere where Work is in progress.

4. Submittals for Record:

a. Where a submittal is for record purposes or special processing or other activity, Architect will return submittal marked "RECORD ONLY."

D. Informational Submittals: Architect will review each submittal and will not return it, return it marked " RECORD ONLY," or will reject and return it if it does not appear to comply with requirements.

E. Unsolicited Submittals: Architect may not review submittals not required by the Contract Documents. Such submittals may be returned to sender without action or discarded.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Products and installation for patching and extending Work.
2. Transition and adjustments.
3. Repair of damaged surfaces, finishes, and cleaning.

B. Related Sections:

1. Section 01 11 00: Summary of Work, for Owner occupancy during construction.
2. Section 01 73 20: Cutting and Patching.
3. Section 01 74 00: Cleaning, for cleaning during construction.
4. Section 02 41 19: Selective Demolition.

PART 2 PRODUCTS

2.1 PRODUCTS FOR PATCHING AND EXTENDING WORK

A. New Materials: As specified in product Sections; match existing Products and Work for patching and extending work.

1. Where new materials are indicated in the Drawings and product Section for material is not included in the Project Manual, provide new materials specified in the Drawings.

B. Type and Quality of Existing Products: Determine by inspection and testing Products where necessary, referring to existing Work as a standard.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that demolition is complete, and areas are ready for installation of new Work.

3.2 PREPARATION

A. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

C. Remove debris and abandoned items from area and from concealed spaces.

D. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.

E. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity.

3.3 INSTALLATION

A. Coordinate work of alterations and renovations to expedite completion sequentially and to accommodate Owner occupancy.

B. Project Finishes: Complete in all respects including operational mechanical and electrical work.

C. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to specified condition.

D. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.

E. In addition to specified replacement of equipment and fixtures restore existing plumbing, heating, ventilation, air conditioning, and electrical systems to full operational condition.

F. Install Products as specified in individual Sections.

3.4 TRANSITIONS

A. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patched Work to match existing adjacent Work in texture and appearance.

B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

3.5 ADJUSTMENTS

A. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

B. Where a change of plane of 1/4 inch or more occurs, submit to Architect a recommendation for providing a smooth transition.

C. Trim existing doors as necessary to clear new floor finish. Refinish trim as required.

D. Fit work at penetrations of surfaces as specified in Section 01 73 29, “Cutting and Patching.”

3.6 REPAIR OF DAMAGED SURFACES

A. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections.

B. Repair substrate prior to patching finish.

3.7 FINISHES

A. Finish surfaces as specified in individual Product Sections.

B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.8 CLEANING

A. In addition to cleaning specified in Division 01 Sections, clean Owner-occupied areas affected by Work of this Project.

END OF SECTION

PART 1 GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. “Approved”: When used to convey Architect’s action on the Contractor’s applications and requests, is limited to the Architect’s duties and responsibilities as stated in the Conditions of the Contract.

C. “Reviewed”: When used in lieu of “Approved” to convey Architect’s action on the Contractor’s submittals, is limited to the Architect’s duties and responsibilities as stated in the Conditions of the Contract.

D. “Directed”: A command or instruction by Architect. Other terms including “requested,” “authorized,” “selected,” “approved,” “required,” and “permitted,” have the same meaning as “directed.”

E. “Indicated”: Requirements expressed by graphic representations or in written form on Drawings, in the Specifications, and in other Contract Documents. Other terms including “shown,” “noted,” “scheduled,” and “specified” have the same meaning as “indicated.”

F. “Regulations”: Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

G. “Furnish”: Supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

H. “Install”: Operations at the Project site including unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

I. “Provide”: Furnish and install, complete and ready for the intended use.

J. “Installer”: Contractor or another entity engaged by the Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

K. “Experienced”: When used with an entity, “experienced” means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.

L. “Project Site”: Space available for performing construction activities. The extent of Project site is shown in Drawings and may or may not be identical with the description of the land on which Project located.

M. “Testing Agencies”: Independent entities engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of the date of the Contract Documents, unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on the Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

D. Conflicting Requirements: Comply with the most stringent requirement when compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels.

1. Refer uncertainties and requirements that are different, but apparently equal, to the Architect for decision before proceeding.

E. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed.

1.3 ABBREVIATIONS AND ACRONYMS

A. Standards and Regulations: Where abbreviations and acronyms are used in Specification or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	800-872-2253 202-272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.govecfr/index.html	866-512-1800 202-512-1800
UFAS	Uniform Federal Accessibility Standards Available from Access Board www.access-board.gov	800-872-2253 202-272-0080

B. Industry Organizations: Where abbreviations and acronyms are used in Specification or other Contract Documents, they shall mean the recognized name of entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The)	703-258-2960

	www.aluminum.org	
AAMA	American Architectural Manufacturers Association www.aamanet.org	847-303-5664
AASHTO	American Association of State Highway and Transportation Officials www.transportation.org	202-624-5800
ACI	American Concrete Institute / ACI International www.aci-int.org	248-848-3700
AF&PA	American Forest & Paper Association www.afandpa.org	800-878-8878 202-463-2700
AGA	American Gas Association www.aga.org	202-824-7000
AGC	Associated General Contractors of America (The) www.agc.org	703-548-3118
AHA	American Hardboard Association (See CPA)	
AIA	American Institute of Architects (The) www.aia.org	800-242-3837 202-626-7300
AISI	American Iron and Steel Institute www.steel.org	202-452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	303-792-9559
ALCA	Associated Landscape Contractors of America (see PLANET)	
ALSC	American Lumber Standards Committee, Incorporated www.alsc.org	301-972-1700
ANSI	American National Standards Institute www.ansi.org	202-293-8020
APA	APA - The Engineered Wood Association www.apawood.org	253-565-6600
APA EWS	APA-The Engineered Wood Association, Engineered Wood Systems (see APA-The Engineered Wood Association)	
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	202-207-0917
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	610-832-9500

AWCI	Association of the Wall and Ceiling Industry www.awci.orgAWI Architectural Woodwork Institute571-323-3626 www.awinet.org	703-534-8300
AWPA	American Wood Protection Association (formerly American Wood-Preservers' Association) www.awpa.com	205-733-4077
AWS	American Welding Society www.aws.org	800-443-9353 305-443-9353
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	212-297-2122
BIA	Brick Industry Association (The) www.bia.org	703-620-0010
CISCA	Ceiling and Interior Systems Construction Association www.cisca.org	630-584-1919
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	301-596-2583
CPA	Composite Panel Association www.pbmdf.com	301-670-0604
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	847-517-1200
CSA	CSA International (Formally: IAS - International Approval Services) www.csa-international.org	866-797-4272 416-747-4000
CSI	Construction Specifications Institute (The) www.csinet.org	800-689-2900 703-684-0300
DHI	Door and Hardware Institute www.dhi.org	703-222-2010
EJMA	Expansion Joint Manufacturers Association, Inc. www.asce.org	914-332-0040
ETL SEMCO	Intertek ETL SEMCO (formally: ITS-Intertek Testing Service NA) www.intertek.com	800-967-5352
FMG	FM Global (Formally FM - Factory Mutual System) www.fmglobal.com	401-275-3000
GA	Gypsum Association www.gypsum.org	202-289-5440
GANA	Glass Association of North America www.glasswebsite.com	785-271-0208

GSI	Geosynthetic Institute www.geosynthetic-institute.org	610-522-8440
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)	
HPVA	Hardwood Plywood and Veneer Association www.hpva.org	703-435-2900
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	212-419-7900
IESNA	Illuminating Engineering Society of North America www.iesna.org	212-248-5000
IGCC	Insulating Glass Certification Council www.igee.org	315-646-2234
IGMA	Insulating Glass Manufacturers Alliance (The) www.igmaonline.org	613-233-1510
ISO	International Organization for Standardization (available from ANSI) www.iso.ch	41 22 74901 11 202-293-8020
ITS	Intertek Testing Service NA (see ETL SEMCO)	
MIA	Masonry Institute of America ww.masonyinstitiute.org	800-221-4000 310-257-9000
MPI	The Master Painters Institute www.paintinfo.com	888-674-8937 604-298-7578
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	630-942-6591
NAIMA	The North American Insulation Manufacturers Association www.naima.org	703-684-0084
NECA	National Electrical Contractors Association www.necanet.org	301-657-3110
NEMA	National Electrical Manufacturers Association www.nema.org	703-841-3200
NFPA	National Fire Protection Association www.nfpa.org	800-344-3555 617-770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	301-589-1776
NGA	National Glass Association www.glass.org	703-442-4890 866-342-5642

NHLA	National Hardwood Lumber Association www.natlhardwood.org	800-933-0318 901-377-1818
NLGA	National Lumber Grades Authority www.nlga.org	604-524-2393
NRCA	National Roofing Contractors Association www.nrca.net	800-323-9545 847-299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	888-846-7622 301-587-1400
NSSGA	National Stone, Sand & Gravel Association www.nssga.org	800-342-1415 703-525-8788
NWCB	Northwest Wall and Ceiling Bureau (Seattle) Northwest Wall and Ceiling Bureau (Portland)	800-524-4215 503-295-0333
PCA	Portland Cement Association www.cement.org	847-966-6200 202-408-5494
SDI	Steel Door Institute www.steeldoor.org	440-899-0010
SGCC	Safety Glazing Certification Council www.sgcc.org	315-646-2234
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)	
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association, Inc. www.smacna.org	703-803-2980
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	877-281-7772 412-281-2331
SWRI	Sealant, Waterproofing, and Restoration Institute www.swrionline.org	816-472-7974
UL	Underwriter's Laboratory, Incorporated www.ul.com	877-854-3577 847-272-8800
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	800-283-1486 503-639-0651
WDMA	Window & Door Manufacturers Association www.wdma.org	800-223-2301 847-299-5200
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	800-550-7889 530-661-9591
WSRCA	Western States Roofing Contractors Association www.wsrca.com	800-725-0333 650-570-5441

WWPA	Western Wood Products Association www.wwpa.org	503-224-3930

C. Code Agencies: Where abbreviations and acronyms are used in Specification or other Contract Documents, they shall mean the recognized name of entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

IBC	International Building Code	
ICC	International Code Council, Inc. www.iccsafe.org	888-422-7233
ICC-ES	ICC Evaluation Service, Inc. www.ice-es.org	800-423-6587 562-699-0543
OSSC	State of Oregon Structural Specialty Code	
NES	(Formally: National Evaluation Service – See ICC-ES)	

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specification or other Contract Documents, they shall mean the recognized name of entities in the following list. Names, telephone numbers, and Web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CPSC	Consumer Product Safety Commission www.cpsc.gov	800-638-2772 301-504-6816
EPA	Environmental Protection Agency www.epa.gov	202-272-0167
OSHA	Occupational Safety & Health Administration www.osha.gov	800-321-6742 202-693-1999

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for quality control services.

1. Quality control services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities.

a. Requirements do not include Contract enforcement activities performed by Architect.

2. Inspection and testing services are required to verify compliance with requirements specified or indicated.

B. Related Sections:

1. Section 01 73 29: Cutting and Patching, for requirements for repair and restoration of construction disturbed by inspection and testing activities.
2. Section 06 10 00: Rough Carpentry, for independent testing requirements for moisture content of wood framing.

1.2 RESPONSIBILITIES

A. Owner will contract separately for services of independent testing laboratory to perform specified inspection and testing.

1. Unanticipated inspections and testing required by authorities having jurisdiction will be paid for by the Owner, unless inspection or testing is required due to failure of the Contractor to perform work of the Contract Documents.

B. Inspections and testing costs required by defective Work or improperly-timed notices, and the following shall be paid by Contractor:

1. Moisture content testing for wood framing lumber by an independent testing agency as required for use of wood framing lumber described in Sections 06 10 00.

C. Utilization of testing laboratory services shall in no way relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

1.3 RETESTING

A. Contractor responsible for retesting and associated cost where results of inspections and tests prove unsatisfactory and indicate noncompliance with requirements.

1.4 ASSOCIATED SERVICES

A. Cooperate with agencies performing inspections and tests.

B. Provide auxiliary services as requested.

C. Notify agency in advance of operations to permit assignment of personnel.

D. Auxiliary services include, but are not limited to, following:

1. Providing access to Work.
2. Furnishing incidental labor and facilities necessary to facilitate inspections and tests.

E. Coordinate activities to accommodate services with a minimum of delay.

F. Contractor is responsible for scheduling inspections and tests.

1. Except where indicated as responsibility of testing agency, Contractor is responsible for taking samples.

1.5 QUALITY ASSURANCE

A. Qualifications for Inspection and Testing Agencies:

1. Engage inspection and testing service agencies that are prequalified as complying with American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in types of inspections and tests to be performed.
2. Each independent inspection and testing agency engaged on Project shall be authorized by authorities having jurisdiction to operate in State where Project is located.

B. Duties of Testing Agency:

1. Testing agency shall cooperate with Architect and Contractor in performing its duties.
2. Agency shall provide qualified personnel to perform inspections and tests.
3. Agency shall notify Architect and Contractor of irregularities of deficiencies observed in Work during performance of its services.
4. Except as otherwise specified, testing laboratory shall secure, handle, and store samples and specimens for testing.

C. Submittals: Testing agency shall submit a certified written report of each inspection and test to:

1. Architect.
2. Contractor.
3. Governmental agencies requiring submission of reports.
4. Other persons as directed by Architect.

PART 2 PRODUCTS - Not Applicable

PART 3 EXECUTION

3.1 MANUFACTURER'S FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations.

1. Observer subject to approval of Architect/Engineer and Owner.

B. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe:

1. Site conditions
2. Conditions of surfaces and installation
3. Quality of workmanship
4. Start-up of equipment
5. Test, adjust, and balance of equipment applicable, and to initiate instructions when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

D. Submit report in duplicate within 30 days of observation to Architect/Engineer for review.

3.2 REPAIR AND PROTECTION

A. Upon completion of inspection, testing, and sample taking, repair damaged construction.

1. Restore substrates and finishes.
2. Comply with Section 01 73 29, "Cutting and Patching."

B. Protect construction exposed by or for quality control service activities and protect repaired construction.

C. Repair and protection are Contractor's responsibility, regardless of assignment of responsibility for inspection and testing.

3.3 EVALUATION OF TESTS AND INSPECTIONS

A. Satisfactory completion of Work will be judged on results of laboratory and site tests and inspections.

B Results of tests and inspections that indicate Work does not comply with requirements of Contract Documents will be considered deficient.

C. Contractor has responsibility to remove and replace deficient Work at Contractor's expense.

END OF SECTION

PART I GENERAL

1.1 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, security and protection facilities.

1.2 USE CHARGES

A. General: Include cost or use charges for temporary facilities in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's operational forces, Architect, testing agencies, and authorities having jurisdiction.

B. Existing Utility Services: Water and electric power from Owner's existing systems is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to:

1. Building code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police and fire department rules.
5. Environmental protection regulations.

B. Standards: Comply with the following:

1. NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."
2. ANSI A10 Series standards for "Safety Requirements for Construction and Demolition."
3. NECA Electrical Design Library "Temporary Electrical Facilities."

C. Electric Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70 "National Electric Code."

D. Tests and Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.3 PROJECT CONDITIONS

A. Keep temporary services and facilities clean and neat in appearance.

B. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

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

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide new materials, or use undamaged, used materials in serviceable conditions, suitable for use intended.

2.2 TEMPORARY FACILITIES

A. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes, of sufficient size and furnished to accommodate needs of construction personnel.

1. Provide enclosed space within field office adequate for project meetings.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.3 EQUIPMENT

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

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid propane gas or fuel oil heaters with individual space thermostatic control.

1. Use of gasoline burning space heaters, or open flame, or salamander heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by UL, FM, or another testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 3 EXECUTION

3.1 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 system as directed by authorities having jurisdiction.

C. Water Service: Use of Owner’s existing water service facilities will be permitted, as long as facilities are cleaned and maintained 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.

1. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of the fixtures and facilities.

E. Electric Power Service: Use of Owner's existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

F. Lighting: Provide temporary lighting with local switching that will provides adequate illumination for construction operations, observations, and inspections.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

G. Heating: Provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity.

H. Telephone: Provide temporary telephone service in common use facilities for use by all personnel engaged in construction activities.

1. Provide one telephone line in each field office.
2. Provide a dedicated telephone line for a facsimile machine in each field office.
3. Make telephone and facsimile service available to use by the Owner and Architect.
4. At each telephone, post a list of important telephone numbers, including the following:

a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.
d. Architect's office.
e. Engineer's office.
f. Owner's office.
g. Principal subcontractor's field and home offices.

I. Electronic Communication Service: Provide temporary electronic communication service including electronic mail, in primary field office.

3.2 SUPPORT FACILITIES

A. Traffic Controls: Comply with requirements of authorities having jurisdiction.

B. Parking: Provide temporary parking areas for construction personnel.

C. Dewatering Facilities and Drains: comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

D. Project Identification Signs: Provide Project identification and other signs.

1. Provide temporary, directional signs for construction personnel and visitors.
2. Do not permit installation of unauthorized signs.

E. Water Disposal Facilities: Comply with requirements specified in Section 01 74 19, Construction Waste Management.

F. Lifts and Hoists: Provide facilities for hoisting materials and employees.

1. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.

3.3 SECURITY AND PROTECTION FACILITIES

A. Environmental Protection:

1. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or that other undesirable effects.
2. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

B. Construction Enclosure Fence: Provide enclosure fence in manner that will prevent people and animals from easily entering construction area.

C. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, or similar violations of security.

D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structural adequate barricades, including warning signs and lighting.

1. Provide appropriate warning signs to inform personnel and the public of hazards being protected against.

E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

F. Temporary Fire Protection: Install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses.

1. Comply with NFPA 10 and NFPA 241.
2. Store combustible materials in containers in fire safe locations.
3. Maintain unobstructed access to fire protection equipment.
4. Supervise welding operations, combustion type temporary heating units, and similar sources of fire ignition.
5. Develop and post information for overall fire prevention and protection program for personnel at Project site.

3.4 TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal.

C. Termination and Removal: Remove each temporary facility when the need for its service has ended no later than Substantial Completion.

D. Repair or replace street paving, curbs, and sidewalks damaged by construction operations, as required by the governing authority.

E. At Substantial Completion, clean and renovate permanent facilities used during the construction period.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes requirements for temporary protection of landscaped areas of trees, plants, and grass.

1.2 DEFINITIONS

A. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

B. Plants: Includes shrubs, ground covers, and other vegetation.

C. Grass: Established grass and turf.

D. Vegetation: Includes all plants and grass, with the exception of trees.

1.3 QUALITY CONTROL

A. Engage a qualified arborist to propose details of proposal to prevent damage to existing trees and other vegetation.

1. Submit a report prior to start of on-site construction work describing preventive measures proposed to protect landscaped areas within Project.

a. Include in report a graphic representation of areas of Project site that contain trees and other vegetation to protect.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 PREPARATION

A. Locate and clearly flag trees and vegetation to be protected.

3.2 TREE AND PLANT PROTECTION

A. Erect and maintain temporary fencing around tree protection zones before starting construction. Remove fencing when construction is complete.

1. Unless otherwise indicated in the Drawings, the drip line of trees identifies the tree protection zone.
2. Do not store construction material, debris, or excavated material within drip line of trees.
3. Do not permit vehicles, equipment or foot traffic within drip line of trees.
4. Maintain fenced area free of weeds and trash.
5. Do not excavate within drip line of trees to remain, unless otherwise indicated

B. Protect grass areas from erosion and ruts by wheeled vehicles and equipment.

1. If necessary, protect grass with sheets of plywood and other suitable covers.

C. Where vegetation cannon be adequately protected during construction operation, remove and store under guidance of a qualified arborist.

1. Replant in original locations at Substantial Completion.
2. Re-sod grass areas that could not be adequately protected during construction operations.

D. Repair or replace trees and vegetation indicated to protected that are damaged by construction operations, in a manner approved by Architect.

1. Engage a qualified arborist to propose details of proposed repairs and to repair damage to trees and other vegetation and to repair damage to trees and plants.
2. Replace damaged trees and other vegetation, including grass areas, that cannot be repaired.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in Project; product delivery, storage, and handling; and manufacturer's standard warranties on products; and special warranties.

B. Related Sections:

1. Section 01 25 00: Substitution Procedures, for product substitutions procedures.
2. Section 01 42 00: Definitions and Reference Standards
3. Section 01 77 00: Closeout Procedures, for submittal of warranties.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into the Work. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by the manufacturer's product name, including make or model number or other designation shown or listed in the 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, except that products consisting of recycled-content materials are allowed. Products salvaged or recycled from other products are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through substitution 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. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Refer to Section 01 25 00 for product substitution procedures.

C. Basis of Design, or Standard of Design, Product Specification: Where the manufacturer's product is named and accompanied by the words "basis of design" or "standard of design," 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 other named manufacturers.

1.3 SUBMITTALS

A. Product List: Before Contractor's first request for payment, submit a complete list of major products proposed for use in the Project.

1. Include proprietary product names, manufacturer's name, and installing Subcontractor's name.

1.4 QUALITY ASSURANCE

A. Source Limitations: Provide products of the same kind from a single source to the fullest extent possible.

B. Compatibility of Products: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods for other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at the site.
2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, or other losses.
3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products subject to damage by weather under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Comply with manufacturer's written instructions for temperature, humidity, ventilation, and weather protection requirements for storage.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitation on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document specifically endorsed by manufacturer to Owner that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project specific information and properly executed.
2. Specified Form: When specified forms are included in the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 02 through 32 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 7700, "Closeout Procedures."

PART 2 PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

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

1. Where products are accompanied by the term "as selected," Architect will make selection.
2. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
3. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," submit product for Architect approval according to requirements of Section 01 25 00, "Substitution Procedures" to obtain approval of an unnamed product.

B. Proprietary Specification Requirements: Where a single product or manufacturer is named, provide the product that complies with requirements. No substitutions are permitted.

C. Manufacturer/Source: Where a single manufacturer or source is named, provide a product by the named manufacturer or source that complies with requirements.

D. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

E. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements. Comply with provisions of Section 01 25 00 for consideration of an unnamed product.

F. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed that complies with requirements. Comply with provisions of Section 01 25 00 for consideration of an unnamed product.

G. Descriptive Specification Requirements: Where a product or assembly listing exact characteristics required, provide a product or assembly that provides those characteristics and otherwise complies with requirements.

H. Performance Specification Requirements: Where compliance with performance requirements are specified, provide products that comply with those requirements and are recommended by the manufacturer for the application indicated.

I. Specified Standards, Codes, and Regulations: Where compliance with an imposed code, standard, or regulation is specified, provide a product that complies with that code, standard, or regulation.

J. Basis of Design, or Standard of Design, Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions of Section 01 25 00 for consideration of an unnamed product by the other named manufacturers.

K. Visual Matching Specification: Where Contract Documents require matching an established sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product match.

1. If no product available within specified category matches and complies with other specified requirements, comply with provisions of Section 01 25 00 for proposal of product.

L. Visual Selection Specification: Where Contract Documents include the phrase "as selected from manufacturer's standard colors, patterns, textures or a similar phrase, select a product that complies with other requirements.

1. Standard Range: Where Contract Documents include the phrase "standard range of colors, patterns, textures" or similar phase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
2. Full Range: Where Contract Documents include the phrase "full range of colors, patterns, textures" or similar phase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

M. Inappropriate Product Selections: If Contractor believes specified product, method, or system is inappropriate for use, Contractor shall notify the Architect before performing Work in question.

1. If notice of objection is not received prior to delivery to site, it will be assumed by Owner that Contractor agrees specified products, methods, and systems are appropriate for use in the Project.

PART 3 EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated.

1. Anchor each product securely in place, accurately located and aligned with other Work.
2. Clean exposed surfaces and protect as necessary from damage and deterioration.

B. Should job conditions or specified requirements conflict with Manufacturers' instructions, consult Architect for further instructions.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes requirements for cutting, fitting, and patching of Work required to:

1. Make several parts fit properly.
2. Uncover work to provide for installing, inspecting, or both, of ill-timed work.
3. Remove and replace work not conforming to requirements of Contract Documents.
4. Remove and replace defective work.

B. Related Sections:

1. Section 01 31 00: Project Management and Coordination, for coordinating cutting and patching with other construction activities.
2. Section 01 35 16: Alteration Project Procedures, for building alterations.
3. Section 01 45 00: Quality Control, for cutting and patching operations related to inspection and testing.
4. Section 02 41 19: Selective Demolition, for demolition of selected portions of the building for alterations.
5. Refer to individual Sections for specific requirements and limitations applicable to cutting and patching.

1.2 SUBMITTALS

A. Proposal for Cutting and Patching: Where cutting and patching involves structural elements, submit for approval a proposal describing procedures. Include the following information in the proposal:

1. Describe extent of cutting and patching required, how it will be performed, and why it cannot be avoided.
2. Indicate changes to structural elements, and changes in appearance of visual elements. Include structural calculations.
3. List products proposed for use and entities that will perform the Work.
4. Indicate dates that work will be performed, duration of the Work, and when work will be uncovered for Architect’s observation.
5. List utilities that cutting and patching work will affect.
6. Submit cost estimate and secure Architect's approval of cost estimate and type of reimbursement before proceeding with cutting and patching

1.3 QUALITY ASSURANCE

A. Structural Work: Do not cut and patch structural elements in a manner that would change their load carrying capacity of load deflection ratio.

1. Obtain approval before cutting and patching structural elements.

B. Do not cut and patch operating elements in a manner that would reduce their capacity to perform as intended, cause increased maintenance, or decreased operational life or safety.

C. Do not cut and patch exposed elements of construction that in the Architect’s opinion would reduce the visual aesthetic qualities or result in visual evidence of cutting and patching.

1. Remove and replace construction cut and patched in a visually unacceptable manner.

1.4 WARRANTY

A. Cut and patch construction using methods and with materials in such a manner as to not void any warranties required or existing.

PART 2 PRODUCTS

2.1 MATERIALS

A. Use new materials identical to existing materials.

B. For exposed surfaces, where identical materials are not available, use materials that visually match existing adjacent surfaces as nearly as possible.

C. Use materials whose installed performance is equal or better to that of existing materials.

PART 3 EXECUTION

3.1 INSPECTION

A. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.

B. After uncovering Work, inspect conditions affecting installation of new Work.

C. Discrepancies: If uncovered conditions are not as anticipated, immediately notify Architect and secure direction before proceeding further.

1. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Provide temporary support of work to be cut, including shoring and bracing as required to maintain structural integrity of Work.

B. Protect existing construction during cutting and patching to prevent damage.

3.3 GENERAL PERFORMANCE

A. Use skilled workers trained and experienced in necessary crafts and familiar with requirements and methods required to restore surfaces to their original condition.

B. Where required, perform excavating and backfilling in accordance with applicable requirements of Division 31 Sections.

C. Provide dust proof barriers where necessary to protect existing surfaces.

3.4 CUTTING

A. Perform cutting and demolition by methods that will provide the least damage to other portions of Work.

B. Prior to cutting existing work, locate concealed utilities to eliminate possibility of service interruption or damage.

C. Cut through concrete or masonry with a carborundum masonry saw or diamond-core drill.

D. When masonry construction must be pierced, furnish and install a steel pipe sleeve in opening and grout in place neatly.

1. Leave grout surface to match existing finish.
2. Fabricate sleeve one inch in diameter larger than pipe or insulation.
3. Pack between sleeve and pipe with waterproof sealant.
4. At penetrations of fire-resistant rated walls, partitions, ceiling, or floor construction, completely seal voids with fire-resistant rated materials as required to maintain assembly of fire-resistant rating of penetrated element, or as required by Building Code.

3.5 PATCHING

A. Perform fitting and adjusting of products to provide a finished installation complying with tolerances and finishes specified for type of construction involved.

B. Where replacement of equipment and fixtures is required, restore existing plumbing, heating, ventilation, air-conditioning, electrical, and similar systems to full operational condition.

C. Refinish surfaces to match existing adjacent finish, patching with seams that are durable and as invisible as possible.

1. Where possible, inspect and test patched area to demonstrate integrity of seam.
2. For continuous surfaces, refinish to nearest intersection or natural break.
3. For assembly, refinish entire unit.
4. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining work in manner that will eliminate evidence of patching and refinishing.

D. When finished surfaces are cut so that smooth transition with existing or new work is not possible, submit to Architect, for approval, recommendation for terminating surface along straight line at natural line of division.

1. Where change of plane of 1/4 inch or more occurs, submit to Architect, for approval, recommendation for providing smooth transition.

3.6 CLEANING

A. Clean areas and spaces where cutting and patching work is performed.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes requirements for maintaining Project buildings and site in a standard of cleanliness during construction period.

B. Related Sections:

1. Section 01 50 00: Temporary Facilities and Control, for removal of temporary facilities.
2. Section 01 74 19: Construction Waste Management
3. Section 01 77 00: Closeout Procedures.

1.2 QUALITY ASSURANCE

A. In addition to standards described in this Section, comply with applicable requirements of governmental agencies having jurisdiction.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Provide personnel, equipment, and materials as needed to maintain specified standard of cleanliness.

2.2 COMPATIBILITY

A. Use only cleaning materials and equipment that are compatible with surfaces being cleaned, as recommended by manufacturer of material.

PART 3 EXECUTION

3.1 PROGRESS CLEANING

A. General: Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.

1. Completely remove all scrap, debris, and waste material from job site and dispose of in a legal manner.
2. Provide adequate storage for items and waste to be removed from job site, observing requirements for fire and environmental protection.

B. Storage Areas: Maintain stored items in an orderly arrangement allowing maximum access, which does not, impeding traffic or drainage.

1. Inspect arrangement of stored materials weekly. Restack, tidy, or otherwise service arrangements.

C. Site and Structures:

1. Inspect site and structures weekly, and more often if necessary, and pick up all scrap, debris, and waste material.

a. Remove such items to place designated for their storage. Maintain site in a neat and orderly condition.

2. Sweep area of construction clean, including interior areas if affected, as often as necessary to maintain a clean environment.

a. Clean, for purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.

3. As required prior to installation of succeeding materials, clean structures or applicable portions thereof to degree of cleanliness recommended by manufacturer of succeeding material.

3.2 FINAL CLEANING

A. "Final Cleaning," for purpose of this Section, and except as may be specifically provided elsewhere, shall be interpreted as meaning level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

B. Prior to Substantial Completion, remove from Project site all tools, surplus materials, equipment, scrap, debris, and waste.

C. Broom clean paved areas on site and public paved areas at approaches to site.

D. Exterior Surfaces:

1. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
2. Hose down entire exterior surfaces of structure if, necessary to achieve a uniform degree of cleanliness.

E. Interior Surfaces:

1. Visually inspect interior surfaces affected by construction and remove all traces of soil, waste materials, smudges, and other foreign matter.
2. Remove paint droppings, spots, and stains.
3. Clean both sides of glass surfaces.

END OF SECTION

PART 1 GENERAL

1.1 WASTE MANAGEMENT GOALS

A. Waste materials produced as a result of this project shall be reused or recycled to minimize impact of construction waste on landfills and to minimize expenditure of energy and cost in fabricating new materials.

1.2 WASTE MANAGEMENT PLAN

A. Reuse or recycle debris generated as a result of work performed on project when practicable and cost effective.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 ON-SITE MATERIALS SORTING AND STORAGE DURING CONSTRUCTION

A. Verify recycling facilities or waste processor requirements for preparation of materials to be accepted and to what degree materials can be contaminated.

B. Recycle the following waste materials:

1. Wood
2. Metals (ferrous and non-ferrous)
3. Cardboard
4. Drywall
5. Masonry and Concrete
6. Office paper

C. Coordinate with local hauler to provide separate containers for recycled materials listed above.

1. Subcontractors shall follow source separation requirements for each waste and use appropriate on-site container for each type of waste material.
2. Provide separate containers for non-recyclable materials.

D. Rebates: Paid or credited by hauler/recycler to Contractor.

E. Inform field personnel and subcontractors about recycling program, and continuously monitor program to verify proper source separation and to avoid contamination of recyclable materials.

F. Recycling Processors and Facilities:

1. Comprehensive list of recycling facilities in Baker City Metro are available from local building permit office.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Contract closeout including, but not limited to, the following:

1. Inspection procedures.
2. Project record documents.
3. Warranties.

B. Closeout requirements for specific construction activities are included in the appropriate Sections.

C. Related Sections:

1. Section 01 29 00: Payment Procedures, for requirements for Applications for Payment for Substantial and Final Completion.
2. Section 01 50 00: Temporary Facilities and Control, for removal of temporary facilities.
3. Section 01 74 00: Cleaning, for final cleaning requirements.

1.2 SUBSTANTIAL COMPLETION

A. Prior to requesting construction observation for determining date of Substantial Completion, complete the following.

1. Prepare a list of items to be completed and corrected (Contractor's Punch List), the value of items on the list, and reasons why the Work is not complete.
2. Advise the Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra stock, and similar items.
7. Make final changeover of permanent locks and transmit keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems and instruction to Owner's personnel.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
11. Complete final cleanup requirements required in Section 01 7400.
12. Touch up and otherwise repair and restore marred, exposed finishes, including touchup painting.

B. Construction Observation: Submit a written request for Architect's observation of the Work for completion of Construction Contract requirements to establish date of Substantial Completion.

1. On receipt of request, the Architect will either proceed with observation of the Work, or without completing process of observation, advise Contractor that based on limited observation, the Work is not sufficiently complete for Substantial Completion.
2. Architect will prepare the Certificate of Substantial Completion after completion of observation of the Work, or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate can be issued.

    a. Architect will perform a final observation of the Work when assured by Contractor that deficiencies identified in previous observation have been completed or corrected.
    b. If additional observation(s) of the Work is required to establish Substantial Completion, the Owner will charge the Contractor to reimburse Architect for time and expenses.
    c. Results of the completed construction observation will form the basis of requirements for final acceptance.

3. Owner will allow Contractor no longer than 30 calendar days from Date of Substantial Completion to remedy deficiencies.

1.3 FINAL COMPLETION

A. Prior to requesting construction observation for determining date of Final Completion, complete the following.

1. Submit a final Application for Payment, according to requirements of Section 01 29 00.
2. Submit certified copy of Architect's Substantial Completion list of deficient items to be completed or corrected, endorsed and dated by Architect, that states that each item has been completed, corrected, or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Construction Observation: Submit a written request for Architect's observation of the Work for completion of Construction Contract requirements for final acceptance.

1. On receipt of request, the Architect will either proceed with observation of the Work and specifically the Substantial Completion list of deficient items to be completed or corrected or advise the Contractor of unfulfilled requirements.
2. Architect will prepare the final Certificate for Payment after completion of observation of the Work or will notify Contractor of Contract requirements that must be completed or corrected before certificate can be issued.

    a. Architect will perform a final observation of the Work when assured by Contractor that deficiencies identified in previous observation(s) have been completed or corrected.
    b. If additional observation(s) of the Work is required to establish Final Completion, the Owner will charge the Contractor to reimburse Architect for time and expenses.

1.4 LIST OF DEFICIENT ITEMS (PUNCH LIST)

A. Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if applicable, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

a. Project name.
b. Date.
c. Name of Architect.
d. Name of Contractor.
e. Page number.

1.5 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes; protect from deterioration and loss.

B. Record Drawings: Maintain and submit one set of black line white prints of Contract Documents or Record CAD Drawings required.

1. Mark the Record Drawings to show the actual installation and construction where installation or construction varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to prepare the marked-up Record Drawings.

a. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

2. Mark record sets with erasable red-colored pencil, clearly describing change by graphic line and note. Use other colors to distinguish between changes for different categories of the Work at the same location.

a. Call attention to entries by a "cloud" drawn around areas affected.

3. Mark important additional information that was either shown schematically or omitted from original Drawings.

a. Conversion of Schematic Layouts: Show on Record Drawings, by dimension accurate to within one inch, centerline of each run of items shown schematically on Drawings. Clearly identify item by accurate note such as "cast iron drain", "galv. water", and the like. Show, by symbol or note, vertical location of item ("under slab", "in ceiling plenum", "exposed", and the like). Relate by identification descriptive to Specifications.
b. Show final location of electrical fixtures.

4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
5. Identify and date each Record Drawings; include the designation “PROJECT RECORD DRAWING” in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets with identification.

C. Record Specifications: Submit one complete copy of Project Specifications, including addenda and contract modifications.

1. Mark copy to indicate the actual product installation where installation or from that indicated in Specifications, addenda, and contract modifications.
2. Mark copy with proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders and other modifications, where applicable.

D. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind miscellaneous records and identify each in same format as specified for Operation and Maintenance Manuals, ready for continued use and reference.

1. One set of evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:

   a. Certificates of Inspection.
   b. Certificates of Occupancy.

2. One set of certificates of insurance for products and completed operations.
3. One set of evidence of payment and release of liens.
4. One copy of list of Subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

1.6 WARRANTIES

A. Submit one set of warranties, organized into an orderly sequence based on the table of contents of the Project Manual, in same format as specified for Operation and Maintenance Manuals.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of a building or structure.
2. Repair procedures for selective demolition operations.

B. Related Sections:

1. Section 01 11 00 Summary of Work, for use of the premises and Owner occupancy during construction.
2. Section 01 35 16: Alteration Project Procedures, for transition of new and existing construction after completion of selective demolition.
3. Section 01 50 00: Temporary Facilities and Controls, for temporary construction, environmental protection measures, and security at Owner occupied areas.
4. Section 01 73 29: Cutting and Patching, for cutting and patching procedures.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose off-site, unless indicated to be **removed and salvaged**, or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver to Owner.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing construction items of construction to remain without removal.

1.3 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain on Owner's property, demolished materials become Contractor's property and shall be removed from Project site. Do not burn or bury materials on site.

1.4 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate sequence of demolition and removal work, interruption of utility services, coordination for shutoff, capping, and continuation of utility services, locations of temporary partitions and means of egress, and coordination of Owner's continuing occupancy of portions of existing building.

B. Pre-demolition Photographs or Videotape: Show existing condition of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before work begins.

1.5 QUALITY ASSURANCE

A. Standards: Comply with the following:

1. ANSI A10.6: "Safety Requirements for Construction and Demolition."
2. NFPA 241: "Safeguarding Construction, Alteration, and Demolition Operations."

3. Applicable local codes for demolition work, safety of structure, and dust control.

B. Obtain required permits from governing authorities.

C. Comply with governing EPA notification regulations before beginning of demolition operations.

D. Comply with hauling and disposal regulations of authorities having jurisdiction.

E. Conduct pre-demolition conference at Project site.

1.6 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct demolition so Owner's operations will not be disrupted. Provide not less than 72 hours notice to Owner of activities that will affect Owner's operations.

1. Do not disable or disrupt building fire or life safety systems without prior written notice to the Owner.

B. Maintain access to existing walkways, corridors, or other occupied or used facilities. Do not close or obstruct egress width to exits.

C. Owner assumes no responsibility for condition of areas to be selectively demolished.

D. Hazardous Materials: Hazardous materials are present on the building. A report on the presence of hazardous materials is on file for review and use to become aware of locations where hazardous materials are present.

1. Hazardous materials will be removed by Contractor when uncovered as part of this contract.
2. Do not disturb materials containing hazardous materials when uncovered or encountered; immediately notify Architect and Owner.

E. Utility Service: Notify affected utility companies of selective demolition before starting work and comply with their requirements for maintaining service, and disconnecting existing services, where required.

1. Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
2. Maintain fire protection facilities in service during demolition operations.

1.7 SCHEDULING

A. Schedule Work to coincide with new construction.

PART 2 PRODUCTS

2.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials, or materials that visually match existing surfaces if identical materials are not available.

B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to start of Work, examine work to be removed and work to remain to determine nature of work and conditions under which selective demolition will be conducted.

1. Make necessary probes to determine extent and kind of protection required.
2. When applicable, verify that utilities have been disconnected.
3. Where existing conditions are found to be conflict with representations of Contract Documents, submit written notification and request clarification.

a. Do not perform Work related to conflicting conditions until clarification is obtained.

3.2 PREPARATION

A. Utilities: Locate, identify, and disconnect if necessary, utilities serving area to be demolished.

B. Provide, erect, and maintain temporary barriers at locations indicated, or as required to separate the public and occupied areas from areas of Work.

C. Erect and maintain weatherproof closures for exterior openings.

D. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

E. Protect existing materials that are not to be demolished or removed.

3.3 SELECTIVE DEMOLITION

A. Conduct demolition to minimize interference with adjacent and occupied building areas.

B. Demolish and remove existing construction only to the extent required by new construction and as indicated.

C. Demolish in an orderly and careful manner. Protect existing supporting structural members.

D. Removed and Salvaged Items: Clean, pack or crate with identification marked on containers, store in a secure area until delivery to Owner, and transport to Owner’s storage area.

E. Removed and Reinstalled Items: Clean and repair to functional reuse, pack or crate with identification marked with identification, protect from damage during storage, and reinstall in locations indicated. Comply with requirements for new materials and equipment.

F. Existing Items to Remain: Protect against damage and soiling during selective demolition. When permitted by Architect, items may be removed to suitable storage and reinstalled in their original locations after demolition operations are complete.

G. Promptly repair damage to adjacent construction caused by selective demolition. Perform patching work in accordance with Section 01 73 29, Cutting and Patching.

H. Remove demolished materials from site as work progresses.

I. Do not burn demolished materials on site.

J. Transport demolished materials off Owner’s property and legally dispose of them.

K. Upon completion of work, leave areas in clean condition. Remove temporary partitions, barriers, and construction.

END OF SECTION

PART 1 GENERAL

1.1 SCOPE OF WORK

A. This section covers removal of any discovered non-friable asbestos roofing materials from the roofs of the School Buildings at Baker School District Campus that have been determined to be non-friable by the Owner's Consultant. The Contractor shall verify that planned removal methods are acceptable within OR-OSHA rules and the Department of Environmental Quality guidelines for maintaining exempt status of this material.

B. Bulk samples of roofing materials on the school buildings will be collected by the PBS Engineering and Environmental. Additional roofing samples may be necessary.

C. This testing performed by the Owner shall not alleviate the contractor from any responsibility for complying with OSHA or DEQ rules. The Owner or its Environmental Consultant cannot be held liable for any citations of non-compliance or injury as a result of the Work.

D. All penetrations into the built-up roof membrane that contain asbestos are to be performed using properly trained personnel.

1.02 RELATED WORK

A. Not Used

B. Not Used

1.03 REFERENCED STANDARDS TO BE INCORPORATED INTO THIS SECTION

A. 29 CFR 1926.1101. OSHA Occupational Exposure to Asbestos, Construction Industry Standard.

B. Johnson Roofing Co. Inc., OSHA Agreement #94-41039, March 15, 1995.

C. U.S. Environmental Protection Agency National Emissions Standards for Hazardous Air Pollutants (NESHAPS). (Code of Federal Regulations Title 40, Part 61, Subparts A and M.).

D. A Guide for Meeting DEQ Rules: How to remove non-friable asbestos-containing roofing materials (December 2002).

E. DOT Regulations 49 CFR 171 & 172.

F. OAR-340 Division 248 Oregon Department of Environmental Quality Asbestos Requirements.

G. A Guide for Meeting DEQ Rules: How to remove non-friable cement asbestos products.

1.04 ASBESTOS RELATED PROCEDURES

A. Removal of the built-up roofing that contains asbestos and that is intact is to be performed in compliance with OSHA 1926.1101, the Johnson Roofing Co., Inc., /OSHA Agreement #94-41039 March 15, 1995, as a minimum.

B. The following procedure shall be followed at a minimum:
1. Provide a competent person on the job-site at all times during roof removal. The competent person is defined in the Johnson Roofing Co., Inc. Assoc./OSHA Agreement #94-41039 March 15, 1995, as a minimum.
2. The competent person shall determine the following:
a. That the material is intact or is non-intact.
b. That appropriate work practices for removal of roofing are utilized.
c. That all workers engaged in the removal are properly trained.
d. That air monitoring is performed.
3. Contractor is to follow all procedures according to OSHA 1926.1101 and the OSHA Agreement #94-41039 March 15, 1995.
4. The Contractor is responsible for DEQ notifications and associated fees.

1.05 REMOVAL PROCEDURES FOR ASBESTOS-CONTAINING BUILT-UP ROOFS

A. Roofing shall be removed in an intact state to the extent feasible.

B. Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards.

C. Cutting machines shall be continuously misted during use, unless a competent person determines that misting substantially decreases worker safety.

D. When removing built-up roofs using a power roof cutter, all dust resulting from the cutting operation shall be collected by a HEPA dust collector, or shall be HEPA vacuumed by vacuuming along the cut line, or by gently sweeping and then carefully and completely wiping up the still-wet dust and debris left along the cut line. The dust and debris shall be immediately bagged or placed in covered containers.

E. Roof material that has been removed from a roof shall not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it shall be lowered to the ground via covered, dust-tight chute, crane, or hoist.

F. Any areas of asbestos-containing roofing material that is not intact shall be lowered to the ground as soon as practicable, but in any event, no later than the end of the work shift. While the material remains on the roof it shall be kept wet, placed in an impermeable water bag, or wrapped in plastic sheeting.

G. Upon being lowered, unwrapped material shall be transferred to a closed receptacle in such manner so as to preclude the dispersion of dust.

H. Roof level heating and ventilation air intake sources shall be isolated and the ventilation system shall be shut down during demolition and roof system installation.

1.06 DISPOSAL OF ASBESTOS-CONTAINING ROOFING MATERIAL

A. The Contractor is required to notify the landfill operator of proposed disposal materials, confirming that the asbestos-containing roofing materials are acceptable at that landfill.

B. The Contractor is to confirm what method of disposal is required and perform transportation, packaging and disposal accordingly.

C. The Contractor is to provide to the owner a sighed, written confirmation from the landfill operator.

D. Provide the appropriate manifest, signed by the Contractor and landfill operator, to the Owner within 410 days of the time the material left the site.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This specification is intended for use in defining the requirements of reinforced concrete strengthening using fiber reinforced polymer systems.

B. The contractor or sub-contractor shall furnish all submittals, materials, tools, equipment, transportation, necessary storage, labor, and supervision required for the application of the composite system.

1.2 REFERENCES

A. General:

1. The publications listed below form a part of this specification to the extent referenced.
2. Where a date is given for reference standards, the edition of that date shall be used. Where no date is given for reference standards, the latest edition available on the date of Notice Inviting Bids shall be used.

B. American Standard for Testing and Materials (ASTM)

1. ASTM D 3039 (1995a), Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials.

C. International Conference of Building Officials (ICC)

1. ICC AC125 (2003), Interim Criteria for Concrete and Reinforced and Unreinforced Masonry Strengthening Using Fiber-Reinforced Polymer (FRP) Composite Systems.
2. ICC AC178 (2001), Acceptance Criteria for Inspection and Verification of Concrete and Reinforced and Unreinforced Masonry Strengthening Using Fiber Reinforced Polymer Composite Systems.

D American Concrete Institute (ACI)

1. ACI 440.2R-02, Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures.

1. 3 PERFORMANCE

A. Design the composite system, ICC ES AC125 design criteria, to achieve the structural performance shown on the structural drawings. Design calculations for the composite system shall be submitted for approval by the engineer of record and shall be stamped by a registered civil engineer.

B. Calculations shall conform to requirements set forth in ICC ES Acceptance Criteria (AC125) and be based on the design modulus and associated area of the composite to be installed. Design values must be lower than the calculated mean determined from the test results received from the ASTM D 3039 field test specimens (see Part 3 of this specification).

1. 4 SUBMITTALS

A. An approved ICC Evaluation Report in the name of the proposed system and the system's manufacturer. Evaluation report must cover the type of strengthening proposed on the project.

B. Provide fire resistance rated assembly (if required) as per ASTM E 84 and ASTM E 119.

C. A material list of items proposed to be provided under this section, including MSDS for each material component.

D. Manufacturer's product data for both the proposed fiber and epoxy to be supplied, specifications, and recommended application procedures showing compliance with the specified requirements. Specifications shall include procedures to properly mix the individual components of the proposed product as well as the proper mix ratios.

E. Certification from the manufacturer of the system's material properties including previously completed ASTM D 3039 test results of the proposed system.

F. Complete shop drawings containing details of the number and thickness of layers, joint and end details and locations to satisfy project requirements.

G. Design calculations for the composite system submitted for approval by the engineer of record, shall be stamped by a registered civil engineer.

H. Applicator project references from at least 25 previously completed projects using the proposed FRP system in the last two-years.

I. Supply the names of at least four individuals who have been certified and trained by the FRP system manufacturer and who will be on site during all phases of the project.

J. Written certification from the composite system manufacturer showing the names of at least three trained personnel who will be on the jobsite during all phases of the installation.

K. A list of at least two different qualified testing laboratories who can perform the required ASTM D 3039 tests indicated in Part 3 of this specification.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver epoxy materials in factory-sealed containers with the manufacturer's labels intact and legible with verification of date of manufacture and shelf life.

B. Store materials in a protected area at a temperature between 40 degrees and 100 degrees F.

C. Products shall be stored according the manufacturer's requirements and shall avoid contact with moisture.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Fyfe Co. LLC;
Nancy Ridge Technology Center, 6310 Nancy Ridge Drive, Suite 103, San Diego, CA 92121. Tel: 858-642-0694, Fax: 858-642-0947, email: info@fyfeco.com.

B. Engineer-of-record approved equal that satisfies requirements of this Specification. Proposed alternate composite system must be approved in an addendum to these specifications by the engineer of record two-weeks prior to the project bid date.

2.2 COMPOSITE STRENGTHENING SYSTEM

A Approved TYFO® Fibrwrap® System to be supplied by Fyfe Company, Nancy Ridge Technology Center, 6310 Nancy Ridge Drive, Suite 103, San Diego, CA 92121. Tel: 858-642-0694, Fax: 858-642-0947. Products include:

1. Composite fabric:

   a. SCH fiber – primary carbon fiber, unidirectional.
   b. SEH fiber – primary glass fiber, unidirectional.

2. Epoxy saturant: Tyfo® S epoxy to be combined with the fiber to form the TYFO® Fibrwrap® composite.
3. Primer/Filler: Tyfo® WS thickened epoxy for protective seal coat, filling voids and primer where needed.
4. Anchorage: System compatible anchors shall be provided by system manufacturer.
5. Finish: Tyfo® A, Tyfo® U, Tyfo® HS, or Tyfo® G paint to be color matched by architect. Alternate finishes must be approved by the system manufacturer.
6. Fire Protection (if required): Tyfo® AFP (Advanced Fire Protection) System, Tyfo® FC/F System or Tyfo® RR finish.

2.3 OTHER MATERIALS

A. Provide other materials as needed for the proper installation of the complete composite system, as selected by the contractor in conformance with these specifications.

PART EXECUTION OF WORK

3.1 APPLICATOR

A. The work specified under this specification shall be performed by an applicator with proven past experience applying the approved composite system for a minimum of 25 projects with over 200 elements strengthened within the last two-years. The applicator must supply the names of at least three individuals who have been certified and trained by the FRP system manufacturer and who will be on site during all phases of the project. The engineer of record shall have the right to approve or reject the personnel qualifications as submitted. The engineer may suspend the work if the contractor substitutes unauthorized personnel for authorized personnel during construction.

B. The composite system applicator shall submit a written description of the proposed epoxy and a complete written description of the application procedures for review by the engineer-of-record. The applicator company must be certified by the manufacturer/supplier and provide a quality control procedure in accordance with Part 3 of this specification.

C. The supply and installation of the composite system is to meet the performance criteria of this specification and as stated on the Contract Drawings. Calculations to determine the installed composite thickness are to be supplied for approval by the Engineer-of-Record.

3.2 SURFACE PREPARATION

A. The surface to receive the composite shall be free from fins, sharp edges and protrusions that will cause voids behind the installed casing or that, in the opinion of the Engineer-of-Record, will damage the fibers. Existing uneven surfaces to receive composite shall be filled with the system epoxy filler or other material approved by the Engineer-of-Record. Filling of large voids in surfaces to receive

composite shall be paid as an extra to the contract work of installing the composite system (small pinholes or micro-bubbles in the concrete surface or resin do not require special detailing). The contact surfaces shall have no free moisture on them at the time of application. If moisture is present, use the manufacturer suggested wet prime epoxy, if available.

B. Repair all damaged concrete, spalls, and irregular surfaces to create a flat, or slightly convex, surface. Sack, or fill with thickened epoxy, surfaces as necessary to eliminate large air surface voids, greater than 0.5 inch diameter. Well-adhered paint and concrete do not require removal.

C. Round off sharp and chamfered corners to a radius of .75 inch (±0.25 inch) by means of grinding or forming with the system's thickened epoxy. Variations in the radius along the vertical edge shall not exceed 1/2 inch for each 12 inches of column height.

3.3 PROCEDURES FOR APPLICATION

A. Preparation work for project: Visit site to ensure that all patch work is complete and cured. Review project specifications in detail.

B. Verify ambient and concrete temperatures. No work shall proceed if the temperature of the concrete surface being repaired is less than 40 degrees F or greater than 100 degrees F. The temperature of the epoxy components shall be between 40 and 100 degrees F at the time of mixing or as specified on the component labels. When air temperature is outside the prescribed range, other measures must be employed to ensure components' temperature is maintained within this range.

C. Prepare the epoxy matrix by combining components at a ratio specified by the system manufacturer, with an allowable tolerance of ± 10 percent. The components of epoxy resin shall be mixed with a mechanical mixer until uniformly mixed, typically 5 minutes at 400-600 rpm. Components that have exceeded their shelf life (as designated on the material label) shall not be used.

D. Both epoxy resin and fabric shall be measured accurately, combined, and deposited uniformly at the rates shown on the approved working drawings and per manufacturer's recommendations. The composite system shall be comprised of fibers completely saturated with epoxy resin per proper ratio.

E. Quality control procedures: Record batch numbers for fabric and epoxy used each day, and note locations of installation. Measure square footage of fabric and volume of epoxy used each day. Complete report and submit to special inspector and system manufacturer.

F. Fabric sampling procedure: On a smooth, flat, level surface covered with polyethylene sheeting, or 16 mil plastic film, prime with epoxy saturant, then prepare sample by placing two layers of saturated fabric oriented in the same direction and allow to cure. Apply additional topping of epoxy as required to ensure complete saturation. Samples shall be stored in a sample box and not moved for a minimum 48 hours after casting. The prepared, identified samples shall be given to a preapproved testing laboratory from the submitted list. (Refer to specified testing procedures and requirements).

G. Installation Procedures:

1. Prepare surface as required, including corner preparation.
2. Remove dust and debris by hand or with compressed air as per specification.
3. Clean up and protect area adjacent to element.
4. Using a roller or trowel, apply one prime coat of thickened epoxy resin to the concrete surface (2 mil. min.). Allow primer to become tacky to the touch.
5. Fill any uneven surfaces or recesses with thickened epoxy.
6. Saturate fabric with epoxy matrix as per manufacturers specifications.
7. Apply saturated fabric to concrete surface by hand lay-up, using methods that produce a

uniform, constant tensile force that is distributed across the entire width of fabric. Under certain application conditions, the system may be placed entirely by hand methods assuring a uniform, even final appearance. Gaps between composite bands may not exceed 1/2 inch width in the fabric's transverse joint unless otherwise noted on project drawings. A lap length of at least 6 inches is required at all necessary overlaps in the primary fiber direction of the fabric.

8. Apply subsequent layers, continuously or spliced, until designed number of layers is achieved, per project drawings.
9. Using a roller or hand pressure, insure proper orientation of fibers, release or roll out entrapped air, and ensure that each individual layer is firmly bedded and adhered to the preceding layer or substrate.
10. Detail all fabric edges, including butt splice, termination points, and jacket edges, with thickened epoxy.
11. Finish: All edges and seams must be feathered with thickened epoxy. Use system as directed by manufacturer. Apply protective coatings as specified between 24 and 72 hours after final application of epoxy. If after 72 hours the epoxy is cured, the surface must be roughened by sanding or brush blasting.
12. System may incorporate structural fasteners, but limitations and detailing must be verified with composite system manufacturer.

3.4 PROCEDURE MODIFICATIONS

A. Installation procedures may be modified to achieve maximum results, subject to approval of the engineer-of-record. Procedure modifications shall be discussed with the engineer-of-record prior to implementing the modifications.

3.5 FIELD QUALITY CONTROL

A. The field quality control procedures shall be in accordance with the following details in addition to ICC AC178, "Acceptance Criteria for Inspection and Verification of Concrete and Reinforced and Unreinforced Masonry Strengthening Using Fiber Reinforced Polymer Composite Systems."

B. Installers:

1. Record batch numbers for fabric and epoxy used each day and note locations of installation. Measure square footage of fabric and volume of epoxy used each day. Complete report and submit to engineer-of-record and system manufacturer.

C. Inspection:

1. Certified Special Inspector, approved by the City of Enterpris, shall periodically observe all aspects of preparation, mixing, and application of materials, including the following:

   a. Material container labels
   b. Surface Preparation
   c. Mixing of epoxy
   d. Application of epoxy to the fiber
   e. Application of composite system
   f. Curing of composite material
   g. Preparation and labeling of test samples

D. The composite casing shall be completely inspected by the Special Inspector during and immediately following application of the composite. The contractor shall monitor the mixing of all epoxy components for proper ratio and adherence to manufacturer's recommendations.

E. Laboratory Testing:

1. Record lot number of fabric and resin used, and location of installation. A “sample batch” shall consist of two 12 inch by 12 inch samples of cured composite. A minimum of two sample batches shall be made daily. The two sample batches will be taken at appropriate times during the day so as to ensure the maximum material deviance in the components of the composite. Testing laboratory shall pre-condition samples at 140 degrees F for 48 hours before testing. Samples shall be tested, at random, at owner’s discretion and cost.
2. Tested samples shall be tested per ASTM D3039. The 12 inch by 12 inch panel shall have 5 coupons, 3/4 inch by 9 inches removed and tested for their material properties in the longitudinal (primary fiber) direction. Tests shall conform to ASTM procedures and manufacturer’s published testing methods. Only pre-qualified testing laboratories shall be used.
3. Testing results shall be made available within 3 weeks of sample submission. Testing shall provide average values of the following:

    a. Ultimate tensile strength
    b. Tensile modulus
    c. Percent elongation

4. 15 percent of all sample batches are suggested to be tested. If one 12 inch by 12 inch sample fails (on average), specimens from the same sample will be tested. If these specimens also fail (on average), the other 12 inch by 12 inch from the same sample batch will be tested. In the extreme case that this sample also fails, the remaining sample batch for that day will be tested and appropriate remedial measures will be taken to ensure integrity of the system from the failed sample batch. In addition, 25 percent of the remaining sample batches will then be tested by the same criteria.

F. Repairs:

1. All defects, including bubbles, delamination, and fabric tears, spanning more than 5 percent of the surface area, or as specified by the owner or engineer, shall be repaired. Two types of repairs shall be performed:

    a. Small defects (approx. 3-inch diameter) shall be injected or back filled with epoxy.
    b. Large defects shall be repaired as required by the consulting engineer’s specifications and manufacturer’s specifications.

2. Small entrapped air pockets and voids naturally occur in mixed resin systems and do not require repair or treatment. Defect repair shall be provided by the manufacturer and be submitted to the structural engineer of record for approval.

G. Remedial Measures: In the event that material testing determines a sample batch to possess insufficient material properties, remedial measures shall be taken. If the tested composite system has material properties determined to be below the minimum specified values, additional layers shall be installed until the final composite thickness is increased by the same percentage as the deficiency of the material’s elastic modulus. Any required additional material and labor for remedial repairs would not be paid for as an extra to the contracted work.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes removal of existing brick veneer and the following replacement cavity wall construction for veneer:

1. Face brick.
2. Mortar and grout.
3. Masonry ties and anchors.
4. Embedded flashing.
5. Miscellaneous masonry accessories.

B. Related Sections:

1. Section 01 4340: Mockup, for mockup requirements affecting work of this Section.
2. Section 03 3000: Cast-In-Place Concrete, for wall backup construction.
3. Section 06 1600: Sheathing, for sheathing on wall backup wood framing.
4. Section 07 1900: Water Repellents, for applied sealer.
5. Section 07 2500: Weather Barriers, for water resistant barrier over sheathing on backup wall framing.
6. Section 07 6000: Flashing and Sheet Metal
7. Section 07 9200: Joint Sealants

1.2 SUBMITTALS

A. Product Data, for each type of product indicated.

B. Shop Drawings, for the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples: Two clay masonry units of each size, color, design and texture specified.

D. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:

1. Masonry units.

a. Include size-variation data verifying that actual range of sizes falls within specified tolerance.
b. Include material test report for efflorescence according to ASTM C 67.

2. Cementitious materials. Include brand, type, and name of manufacturer.
3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.

E. Mix Designs: For each type of mortar and grout, including description of type and proportions of ingredients.

1.3 QUALITY ASSURANCE

A. Use skilled masons trained and experienced in necessary crafts and familiar with requirements and methods needed for proper performance of work of this Section.

B. Source Limitations for Masonry Materials: Obtain exposed masonry units of a uniform texture and color, or a uniform blend with the ranges accepted for these characteristics, through from one source from a single manufacturer for each product required.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.

D. Comply with recommendations of Brick Institute of America (BIA) Technical Notes.

1.4 REGULATORY REQUIREMENTS

A. Comply with requirements of Chapter 21 of the Washington Structural Specialty Code.

1. Comply with seismic design requirements of Washington Structural Specialty Code Section 2106 for Seismic Design Category D.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units above ground on level platforms in a dry location.

B. If not stored in an enclosed location, cover tops and sides with waterproof sheeting to protect against wetting prior to use. If units become wet, do not install until they are dry.

C. Protect from damage.

D. Store cementitious materials above ground, under cover, and in a dry location. Do not use cementitious materials that have become damp.

E. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

F. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day’s work. Cover partially completed masonry when construction is not in progress. Work under cover during rainy weather.

1. Prevent grout, mortar, and soil from staining face of exposed masonry. Immediately remove grout, mortar, and soil that come in contact with such masonry.

B. Cold-Weather Requirements: Comply with cold-weather construction requirements contained in ACI 530.1., in Section 2104.3, and the following:

1. Do not place unit masonry when air temperature is below 40 degrees F, unless using special procedures approved by Architect.
2. Do not use frozen materials or materials mixed or coated with ice or frost.
3. Do not build on frozen substrates.
4. Remove and replace unit masonry damaged by frost of by freezing conditions.

C. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1.

D. Protect masonry construction from direct exposure to wind and sun when erected in ambient air temperatures exceeding 90 degrees F in shade, with relative humidity less than 50 percent.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Brick: Subject to compliance with requirements, provide unit masonry products from one of the following:

1. Mutual Materials Co.
2. Interpace.
3. Interstate Brick.

B. Joint Ties, and Anchors:

1. Dayton Superior Corporation, Dur-O-Wall Division.
2. Hohmann & Barnard, Inc.

C. Substitutions: Submit according to requirements of Section 01 2500.

2.2 BRICK

A. Face Brick: Comply with ASTM C 216, Grade SW, Type FBS.

1. Unit Compressive Strength: ASTM C 216; Minimum average net-area compressive strength of 3000 psi at 28 Days.
2. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested in accordance with ASTM C 67.
3. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated: “not effloresced.”

B. Size: 3-1/2 by 2-1/2 by 7-1/2 inches; Verify to match existing.

1. Provide special shapes for applications where stretcher units cannot accommodate special conditions, and where special shapes for applications produced by sawing would result in sawed surfaces being exposed to view.

C. Face Texture and Color: Match existing.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I, except Type III may be used for cold-weather construction. Provide natural color.

B. Hydrated Lime: ASTM C 207; Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.

D. Aggregate for Mortar: ASTM C 144. For mortar exposed to view, use washed aggregate consisting of natural sand or crushed stone.

E. Aggregate for Grout: ASTM C 404.

F. Admixtures: Integral Liquid Water Repellent for Exterior Walls; “Dry-Block Mortar Admixture” by W.R. Grace or approved.

1. Do not use other admixtures unless specifically approved in advance by Architect.
2. Do not use calcium chloride in mortar or grout.

G. Water: Potable.

H. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides.

1. Custom.
2. Davis Colors; True Tone Mortar Colors.
3. Solomon Grind-Chem Services, Inc.; SGS Mortar Colors.
4. Sonneborn Sonobrite.

2.4 REINFORCING TIES AND ANCHORS

A. Masonry Joint Reinforcing, General: ASTM A 951; hot-dip galvanized steel wire.

B. Masonry Joint Reinforcement for Veneers Anchored with Seismic Veneer Anchors: Single 0.188 inch diameter, hot-dip galvanized steel continuous wire.

C. Seismic Veneer Anchors:

1. Dayton Superior Corporation, Dur-O-Wall Division; D/A 213S.

a. Fasteners: (2) D/A 808.

2. Hohmann & Barnard, Inc.; DW-10 Anchor and TeXroseal with Byna-Tie and Seismiclip.

a. Fasteners: (2) Self-Drilling Self-Tapping Screws; #10 – 16 x 1-1/2 inch Hex Washer Head, zinc plated.

2.5 MASONRY ACCESSORIES

A. Preformed Control Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805, or PVC, complying with ASTM D 2287, Type PVC-65406.

B. Flexible Rubberized Asphalt Sheet (Thru-Wall) Flashing: Composite flashing product of pliable adhesive rubberized-asphalt compound, bonded to a high density, cross-laminated polyethylene film to product an overall thickness of not less than 0.040 inch (40 mils). Provide one of the following, or approved:

1. FortiFlash, 40 mil; Fortifiber Building System Group.
2. Perm-A-Barrier Wall Flashing; W. R., Grace & Co.
3. Polyguard 401 Thru Wall Flashing Membrane: Polyguard Products, Inc.

C. Sheet Metal Flashing: Provide metal flashing as follows complying with SMACNA's "Architectural Sheet Metal Manual" and as specified in Section 07 6000.

1. Stainless Steel: ASTM A 240, Type 304, minimum 0.019 inch thick.

D. Veneer Cavity Fill Material: 10 inches high by thickness applicable to cavity width.

1. Mortar Net USA, Ltd.; "Mortar Net."

E. Preformed Weeps: Free-draining mesh made from polyethylene strands, full height and width of head joint and depth 1/8 inch less than depth of outer wythe; color as selected to match masonry color.

1. Mortar Net USA, Ltd.; "Mortar Net Weep Vents."

F. Sealant: As specified in Section 07 9200; color as selected by Architect.

2.6 MASONRY CLEANER

A. Proprietary acidic cleaner for new masonry; one of the following, or approved.

1. Diedrich Technologies, Inc.; 202 New Masonry Detergent.
2. ProSoCo, Inc.; Sure Klean No. 600 Detergent

2.7 MORTAR AND GROUT MIXES

A. Mortar:

1. Type S, in accordance with ASTM C 270, BIA Technical Notes 8A, and IBC Table 2103.7(1), Proportion Specification.
2. Minimum Compressive Strength f'm at 28 Days: 1,800 psi when tested in accordance with ASTM C 270.

a. Use Type M with minimum compressive strength of f'm of 2,500 psi at 28 days for masonry at and below grade in contact with earth.

3. Proportions:

a. One part portland cement to 1/4 part hydrated lime and 3 parts sand by volume.
b. For exterior walls add 2 lbs. minimum of waterproofing admixture per bag of cement, or as recommended by manufacturer.
c. Accurately measure; shovel measurement not allowed.
d. For mineral oxide pigments, do not use more than 10 percent.

4. Mechanically mix in a batch mixer for not less than 3 minutes, using only sufficient water to produce a mortar that is spreadable and of a workable consistency.
5. Retemper mortar with water as required to maintain high plasticity.

a. Discard and do not use mortar that is unused after 2-1/2 hours following initial mixing.

6. Pigmented Mortar: Pigments shall not exceed 10 percent of portland cement by weight.

B. Grout:

1. Fine or coarse grout in accordance with ASTM C 476 and IBC Table 2103.10.
2. Minimum Compressive Strength f'm at 28 Days: 2,000 psi. when tested in accordance with ASTM C 1019.
3. Provide "fine grout" or "coarse grout" as required by job conditions for dimensions of grout spaces and pour height.
4. Proportions:

    a. For "fine grout", one part portland cement to 2-1/4 parts minimum to 3 parts maximum of damp loose sand, with sufficient water to achieve fluid consistency. Provide water-reducing admixture.
    b. "Fluid consistency" is interpreted as meaning as fluid as possible for pouring in place without segregation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify conditions comply with requirements for installation tolerances and other conditions affecting performance of work.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 COORDINATION

A. Coordinate with other trades as required to assure proper and adequate provision in work of those trades for interface with work of this Section.

3.3 INSTALLATION

A. Install work of this Section in accordance with construction documents and manufacturer's or referenced standard's recommended installation procedures.

B. General:

1. Lay only dry masonry units. Wet brick before laying if initial rate of absorption exceeds 30 g/30sq. in. per minute when tested per ASTM C 67.
2. Use masonry saws to cut and fit masonry units.
3. Set units plumb, true to line, and with level courses accurately spaced and joints uniform.
4. Clean top surface of foundation free from dirt, debris, and laitance.
5. Accurately fit units to plumbing, ducts, openings, and other interfaces, neatly patching holes.
6. Keep walls continually clean, preventing grout and mortar stains.
7. Provide expansion joints where shown, or where not shown, at 32 feet o.c. maximum where no change occurs in wall plane. Do not exceed isolated masonry panel's length to height (aspect) ratio of 1-1/2 maximum.

    a. Install sealant at control joints.

C. Bond: Unless otherwise shown, provide running bond with vertical joints located at center of masonry units in alternate course below and above.

D. Do not use chipped, cracked, or broken units. If such units are discovered in finished work, Architect will require their immediate removal and replacement with new units at no additional cost to Owner.

E. Laying up:

1. Place units in mortar with full shoved bed and head joints.
2. Provide uniform joints approximately 1/2 inch wide; verify to match existing.
3. Align vertical cells of hollow units to maintain a clear and unobstructed system of flues.
4. Where temporarily stop work, rack back each course; toothing not permitted. Hold racking to an absolute minimum.
5. Butter heads of both units where adjacent, to make wall watertight.
6. Units to be firm when in place. If loose or crooked, completely remove unit and mortar and replace.

F. Anchoring Masonry Veneers:

1. Anchor masonry veneer to wood studs.
2. Fasten each anchor section through sheathing to studs with 2 metal fasteners of type indicated.
3. Embed tie section in masonry joints.
4. Locate anchor section relative to course to allow maximum vertical differential movement of tie up and down.
5. Install one wall tie for each 1.77 square feet of wall area spaced as follows, unless otherwise required by building code for wind and seismic loads.

    a. Space anchors not more than 16 inches on center vertically and horizontally, unless evidence is otherwise submitted to show compliance with building code.

6. Install additional anchors within 12 inches of openings spaced at intervals around perimeter not exceeding 36 inches.

G. Tooling:

1. Tool joints to a dense, smooth surface.
2. Unless otherwise noted, provide joints of "concave" profile.
3. Tool joints to make weathertight.

H. Pointing:

1. Pointing: Remove mortar fins and loose mortar.
2. Fill cracks and bee holes.

I. Sealant Joints:

1. Provide 3/8 inch wide minimum by 3/4 inch deep continuous bead of sealant with backer rod around openings and at expansion joints in masonry, unless otherwise noted.
2. Sand sealant joints to match adjacent mortar color.

J. Flashing:

1. Install flexible thru-wall sheet flashing starting 1/2 inch inside of exterior face of masonry, through veneer, and up face of sheathing minimum of 8 inches and behind weather barrier.
2. Install flexible thru-wall sheet flashing at lintel and shelf angles a minimum of 4 inches into masonry at each end; at heads and sills extend flashing at ends and turn up minimum 2 inches to form a pan. Install preformed end dams where available from membrane manufacturer of product selected for flexible flashing.
3. Install metal flashing where indicated.

K. Install preformed veneer cavity fill material on top of thru-wall flashing to spatter mortar droppings and to maintain drainage according to manufacturer's instructions.

L. Weeps and Vents:

1. Install preformed weeps vents in head joints of first course of masonry immediately above embedded flashing spaced at 24 inches o.c., full-height and full-width of joint.
2. Install preformed weep vents in vertical head joints at top of each continuous cavity spaced at 24 inches o.c., full-height and full-width of joint.

3.4 CLEANING, ADJUSTMENT AND PROTECTION

A. Inspection and adjustment:

1. Upon completion of work of this Section, make a thorough inspection of installed masonry and verify that units have been installed in accordance with provisions of this Section.
2. Make necessary adjustments.

B. Protect against dislodgement until mortar has set.

C. Protect work of others from damage.

D. Clean, without damaging, masonry surfaces.

1. Mask to protect materials that could be damaged by cleaning agents.
2. Follow cleaning solution manufacturer's instructions.
3. Rinse cleaning solution with low pressure water (120 psi maximum).
4. Do not use muriatic acid cleaning solutions.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes, but not limited to, the following:

1. Framing with dimension lumber.
2. Wood blocking and nailers.
3. Nails, bolts, screws, framing anchors and other rough hardware required to perform rough carpentry.

B. Related Sections:

1. Section 01 22 00: Unit Prices, for work of this Section based on unit-price for wood framing replacement, authorized under provisions of Section 0 2200, “Unit Prices.”
2. Section 01 35 16: Alternation Project Procedures, for procedures for interface of replacement framing with existing.
3. Section 01 45 00: Quality Control, for independent testing procedures for testing for wood moisture content.
4. Section 06 16 00: Sheathing, for wood structural panels.

1.2 DEFINITIONS

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

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

1. ALSC: American Lumber Standard Committee, Incorporated.
2. APA: American Plywood Association.
3. AWPB: The American Wood-Preservers' Association.
4. NLGA: National Lumber Grades Authority.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.3 SUBMITTALS

A. Material certificates for dimension lumber specified to comply with minimum allowable unit stresses.

1. Indicate species and grade for each use and design values approved by the ALSC Board of Review.

B. Wood data for wood preservative treatment from chemical treatment manufacturer.

1. Include certification by treating plant that materials comply with requirements.
2. Indicate type of preservative used and net amount of preservative retained.
3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

C. Research or evaluation reports acceptable to authorities having jurisdiction indicating compliance with State Building Code for the following:

1. Metal framing anchors.
2. Power-driven fasteners.
3. Power-actuated fasteners.
4. Engineered wood products.
5. Wood preservative treated wood.

1.3 QUALITY ASSURANCE

A. Use skilled workers, trained and experienced in necessary crafts, familiar with specified requirements and methods needed for proper performance of Work of this Section.

B. Codes and standards:

1. In addition to complying with applicable codes and regulations of governmental agencies having jurisdiction, unless otherwise specifically directed or permitted by Architect, comply with the following:

a. WWPA Product Use Manual, for selection and use of products.
b. American Forest & Paper Association, National Design Specifications for Wood Construction, for conformance with structural lumber and fastenings.

C. Test framing lumber for moisture content after deliver to site before use, and after framing is complete and just before application of wood sheathing products specified in Section 06 1600, “Sheathing,” and drywall products specified in Section 09 2900, “Gypsum Board.”

1. Provide testing by an independent agency approved by Architect, in accordance with requirements of Section 01 4500, “Quality Control.”
2. Provide test results to installers of work of Sections 06 16 00, “Sheathing,”.

1.4 REGULATORY REQUIREMENTS

A. Comply with State of Oregon Structural Specialty Code, based on IBC, Chapter 23.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protection:

1. Stack lumber flat and shored up off ground surface on blocks or raised platform.
2. Cover wood and protect from weather exposure.
3. Space between each bundle to provide air circulation.
4. Identify framing lumber as to grades and store each grade separately from other grades.

1.6 COORDINATION

A. Coordinate as required with other trades to assure proper and adequate provision in work of those trades to interface with work of this Section.

PART 2 PRODUCTS

2.1 WOOD PRODUCTS

A. Lumber Standard: Comply with American Softwood Lumber Standard, DOC PS 20.

1. Dressing Requirements: Smooth four sides, S4S, unless otherwise indicated.
2. Maximum Moisture Content for Lumber 3 Inches and Less in Least Dimension: 15 percent at time of delivery to site and at time that drywall products are installed over wood framing.

a. Test for moisture content as described in “Quality Assurance” article.

B. Engineered Wood Products:

1. Provide engineered wood products that are acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
2. Allowable Stress Design: Provide engineered wood products with allowable design stresses, as published by manufacturer, which meet or exceed those indicated.

2.2 GRADE AND TREATMENT STAMPS

A. Identify each piece of framing lumber by grade stamp of WCLIB or WWPA.

B. Stamp each preservative treated wood piece with AWPB treatment stamp or furnish certificate of inspection with each shipment.

2.3 PRESERVATIVE TREATED MATERIALS

A. General: Provide lumber complying with requirements of AWPA C2.

B. Do not use chemicals containing arsenic or chromium.

C. For exposed wood to receive stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, contain colorants, or adversely affect finishes.

D. Kiln dry after treatment to a maximum moisture content of 15 percent for wood.

E. Treat the following wood items:

1. Nailers, blocking, stripping and similar items in associated with roofing, flashing and waterproofing.
2 Floor plates, sills, sleepers, blocking, furring, stripping and similar items in contact with concrete or masonry.
3. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.

F. Where possible, precut material before treatment. Apply field treatment complying with AWPA M4 to cut surfaces.

G. Products:

1. Nisus Corporation: BORA-CARE Wood Preservative.
2. Chemical Specialties, Inc., ACQ Preserve Plus.
3. Substitutions: Submit in accordance with requirements of Section 01 25 00.

2.4 WOOD MATERIALS

A. Concealed Dimension Lumber: Provide species of grades indicated:

1.	Studs and Plates, Non-Load Bearing:	Douglas Fir Stud Grade	NLGA, WWPA, WCLIB
2.	Studs and Plates, Load Bearing:	Douglas Fir No. 2 & BTR	NLGA, WWPA, WCLIB
3.	Other Framing:	Douglas Fir No. 2	NLGA, WWPA, WCLIB
4.	Beams, Stringers and Posts:	Douglas Fir No. 1	NLGA, WWPA, WCLIB
5.	Bucks, Blocking, Bridging, Stripping and Miscellaneous:	Douglas Fir No. 2	NLGA, WWPA, WCLIB
6.	Sills, Sleepers, Plates, Nailing Blocks and Other Wood in Contact with Concrete or Masonry:	Pressure Treated Douglas Fir No. 2	NLGA, WWPA, WCLIB
7.	Concealed Boards for Furring.	Common No. 3 Standard	WWPA WCLIB

B. Concealed Engineered Wood Lumber:

1. Laminated Veneer Lumber (LVL): Structural composite of wood veneers with grain primarily parallel to member lengths, manufactured with exterior-type adhesive complying with ASTM D 2559 and containing no urea formaldehyde, evaluated and monitored according to ASTM D 5456.

2. Parallel Strand Lumber (PSL): Structural composite of wood strand elements with grain primarily parallel to member lengths, manufactured with exterior-type adhesive complying with ASTM D 2559 and containing no urea formaldehyde, evaluated and monitored according to ASTM D 5456.

3. Acceptable Manufacturers: Subject to compliance with requirements, provide products from the following, or approved:

   a. Trus Joist, a Weyerhaeuser business.

C. Exposed Framing Lumber: Provide species and of grades indicated according to the ALSC National Grading Rule provisions of the inspection agency listed.

1. Douglas Fir, Select Structural; WWPA.

2.5 FASTENERS

A. General:

1. Provide fasteners of size and type indicated that comply with requirements specified for material and manufacture

2. Where in contact with preservative treated wood, provide fasteners as follows:

   a. Interior Locations: Hot-dip, zinc coated complying with ASTM A 153.
   b. Exterior Locations and where stainless steel framing anchors are used: Type 304 stainless steel.

B. Screws for fastening: Steel drill screws, in type and length recommended by screw manufacturer for material being fastened, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117. Provide washers or plates if recommended by sheathing manufacturer.

C. Nails: ASTM F 1667.

D. Wood Screws: ASME B18.6.1.

E. Bolts: Steel bolts complying with ASTM A 307, Grade A, with ASTM A 563 hex nuts and where indicated, flat washers.

F. Power Driven Fasteners: NES NER-272.

G. Powder Activated Drive Pins: Hilti or Ramset.

H. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488.

1. Interior Locations: Carbon steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Exterior Locations: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.
3. Attachment to Concrete: Kwik-Bolt or sleeve Anchor by Hilti, Red Head Wedge Anchor by Phillips, Trubolt or Dynabolt by Ramset, Parabolt by U.S.M.
4. Attachment to Masonry: Sleeve Anchor by Hilti, Red head. Sleeve anchor by Phillips.

2.6 METAL FRAMING ANCHORS

A. Basis of Design Products: Subject to compliance with requirements, provide products by Simpson Strong-Tie Company, Inc.

1. Substitutions: Submit according to requirements of Section 01 25 00.

B. Interior Locations; Galvanized Steel Sheet: Hot-dip, zinc coated steel sheet complying with ASTM A 653 coating designation.

1. Where in contact with preservative treated wood: Provide G185 coating.

C. Exterior Locations; Stainless Steel: ASTM A 666, Type 304. Type 316.

2.7 MISCELLANEOUS MATERIALS

A. Construction Adhesive/Glue: Per Industry Standard APA AFG-01.

1. Adhesive for Gluing to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

B. Sill-Sealer Gaskets: Glass-fiber resilient insulation 1-inch nominal thickness, compressible to 1/32 inch, width to suit width of sill members.

1. Damp Locations: Closed-cell neoprene foam, ¼-inch, width to suit width of sill members.

C. Water Repellant Preservative: NWWDA tested and accepted formulation containing 3-indo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

D. Separation Membrane: ASTM D 226, Type II, No. 30 asphalt saturated roofing felt.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required level and lines, with members plumb, true to line, cut, and fitted.

1. Produce joints that are tight, true, and well nailed.
2. Do not shim framing components.

B. Provide and locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

C. Framing Standard:

1. Comply with American Forest & Paper Association's (AF&PA) "Details for Conventional Wood Frame Construction," unless otherwise indicated.
2. Install engineered wood products to comply with manufacturer's written instructions.
3. Use only wood for framing that has been tested by independent testing agency as meeting specified moisture content requirements.

D. Metal Framing Anchors: Install to comply with manufacturer's written instructions.

1. Provide metal post caps and bases at posts and columns.

E. Do not splice structural framing members between supports.

F. Provide minimum 2-inch nominal thick blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, trim, plumbing, electrical equipment, and the like.

G. Provide fire blocking in stud spaces, furred spaces, and other concealed cavities as indicated using fitted solid wood blocks of same width as framing members and 2-inch nominal thickness and as follows:

1. Fire block concealed spaces of walls and partitions at each floor level, at ceiling line of top story, at not more than 96 inches o.c.
2. Fire block furred spaces of walls, at each floor level, at ceiling, not more than 96 inches o.c.

H. Selection of Lumber Pieces:

1. Select individual pieces so that knots and obvious defects do not interfere with placing bolts or nails for proper connections.
2. Cut out and discard pieces with defects that render a piece unable to serve its intended function.
3. Lumber may be rejected by Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.
4. Hand select exposed framing members for appearance and function.

I. Provide field treatment complying with AWPA M4 to cut surfaces of preservative treated lumber.

J Securely attach rough carpentry to substrates by anchoring and fastening as indicated, complying with the following:

1. Oregon Structural Specialty Code, IBC Table 2304.9.1, "Fastening Schedule."
2. NES NER-272 for power-driven fasteners.

K. Use common wire nails, unless otherwise indicated.

1. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.
2. Make tight connections between members.
3. Install fasteners without splitting wood.

L. Hang mechanical equipment, mechanical and sprinkler piping larger than 2-inch diameter, or other items producing hanger load over 50 lbs. by a system approved by Architect.

1. Provide additional framing for any hanger producing a load over 200 lbs. to transfer loads to main structural beams or walls.

M. Wood Furring: Install level and plumb with closure strips at edges and openings, and at each floor and ceiling surface. Shim as required for tolerance of finished work.

1. Furring to Receive Gypsum Board: Install 1 by 2 nominal size at 16 inches o.c.
2. Furring to Receive Plywood: Install 1 by 3 nominal size at 24 inches o.c.

N. Insulate preservative treated materials and incompatible metal surfaces with No. 30 felt separation membrane, or by painting each surface of contact with bituminous coating.

3.2 FIELD QUALITY CONTROL

A. Do not conceal wood framing until independent testing agency has evaluated moisture content of framing lumber.

B. Test Requirements: Employ an Independent Testing Laboratory to evaluate moisture content of framing lumber.

1. Independent Testing Laboratory will evaluate moisture content of framing lumber at time of delivery to site.

a. Notify Independent Testing Laboratory 24 hours prior to delivery to site.

2. Independent Testing Laboratory will evaluate moisture content of framing lumber after framing is installed and just before start of drywall products intended to conceal framing.

    a. Notify Independent Testing Laboratory 24 hours prior to start of wood sheathing products specified in Section 06 1600, “Sheathing”.

C. Remedial Requirements:

1. Framing lumber delivered to site found to have a moisture content higher than specified shall be rejected. Contractor must remove from site all framing lumber with moisture content higher than specified.
2. Framing lumber found to have a moisture content higher than specified just before start of drywall products intended to conceal framing shall be dried in place using a method acceptable to Architect.

    a. Do not conceal any wood framing with drywall products that has a moisture content higher than specified.

3.8 CORRECTION OF DEFECTIVE WORK

A. Remove split and warped framing prior to installation of finish materials.

B. Adjust framing to comply with location and deflection requirements of National Design Specifications for Wood Construction.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof sheathing.

B. Related Sections:

1. Section 06 10 00: Rough Carpentry, for wood framing and plywood backing panels.
2. Section 07 60 00: Flashing and Sheet Metal, for flexible membrane flashing installed at framed openings.
3. Structural Drawings: Structural Notes related to sheathing.

1.2 SUBMITTALS

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

1. Include data for wood preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a 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.

B. Research / Evaluation Reports: For the following, showing compliance with Building Code:

1. Preservative treated plywood.

1.3 QUALITY ASSURANCE

A. Codes and Standards:

1. In addition to complying with applicable codes and regulations of governmental agencies having jurisdiction, unless otherwise specifically directed or permitted by Architect, comply with the following:

a. United States Product Standards, Standard for Construction and industrial Plywood, PS1 ANSI A199.1.
b. APA Plywood Design Specification APA Y510.

B. Fire-Test-Response Characteristics: For assemblies with fire resistance ratings, provide materials and construction identical to those assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings

PART 2 PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

A. Wood Structural Panels: Provide APA performance rated panels complying with grade, span rating, and exposure durability classification indicated, and the following:

1. Plywood: DOC PS 1.
2. Factory mark panels to indicate compliance with applicable standard.

2.2 PRESERVATIVE TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA C9

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Mark plywood with appropriate classification marking of an inspection agency.

C. Kiln dry plywood after treatment to a maximum moisture content of 15 percent.

D. Treat the following wood items:

1. Plywood used with roofing, flashing, and waterproofing.
2 Plywood in contact with concrete or masonry.
3. Where indicated in Drawings.

E. Acceptable Products: Subject to compliance with requirements, provide products of one of the following, or approved:

1. Nisus Corporation: BORA-CARE Wood Preservative.
2. Chemical Specialties, Inc., ACQ Preserve Plus.

2.4 WOOD SHEATHING

A. Wall Sheathing:

1. Wall Sheathing: C-C plywood, square edges, Exterior, Structural I.

a. Span Rating: Not less than 24/0 o.c.
b. Nominal Thickness: Not less than 1/2 inch.

2. Oriented Strand Board: Not allowed as substitute for plywood.

B. Roof Sheathing:

1. Roof Sheathing: C-C plywood, square edges, Span Rating 32/16 not less than, Exterior, Structural I.

a. Span Rating: Not less than 32/16 o.c.
b. Nominal Thickness: Not less than 3/4 inch, unless required to match existing.

2.6 FASTENERS

A. Roof and Wall Sheathing: Hot-dip zinc coated complying with ASTM A 153 or Type 304 stainless steel.

B. Nails: ASTM F 1667.

C. Wood Screws: ASME B18.6.1.

D. Power Driven Fasteners: NES NER-272.

2.7 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 or ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

B. Flexible Membrane Flashing: Specified in Section 07 60 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify edge blocking is in place and located properly prior to installation of sheathing.

3.2 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

1. Provide field treatment complying with AWPA M4 to cut surfaces of preservative treated plywood.

C Securely attach to substrate by fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in State of Oregon Structural Specialty Code based on International Building Code.

D. Use common wire nails, unless otherwise indicated.

1. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.
2. Make tight connections.
3. Install fasteners without splitting wood.

E. Coordinate wall and roof sheathing installation with flashing and joint sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through complete assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing, including weather barriers specified in Section 07 25 00, so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.3 WOOD STRUCTURAL PANEL INSTALLATION

A. Comply with applicable recommendations in APA Form No. E30S, “Engineered Wood Construction” for types of structural use panels and applications indicated.

B Subflooring, Wall, and Roof Sheathing:

1. Place wood sheathing panels with face grain perpendicular to supports at roof and vertically at walls, continuously over at least two supports, except where otherwise indicated. Stagger end joints 4 feet at adjacent panels.
2. Adjust layout to eliminate sheathing pieces less than one foot wide.
3. Center joints over supports. Space panels 1/8 inch apart at edges and ends.
4. Back panel edges with minimum 2 by 4 wood blocking, or with same framing material used for support of wall and roof sheathing.
5. Fastening Wood Sheathing for Roofs:

    a. Nail to wood framing. Use minimum 8d common nail size for nailing 5/8 inch thick wood sheathing; use minimum 10d common nail size for nailing 3/4 inch thick wood sheathing. **Apply a continuous bead of glue to framing members at edges of roof sheathing panels.**

        1) Use ring shank nails for nailing sheathing at roof corners.
        2) Use fastener length that minimum 1/8 inch of fastener penetrates beyond bottom of wood sheathing panel.

    b. Space panels 1/8 inch apart at edges and ends.
    c. Space nails at minimum of 6 inches on center at panel edges, and in panel field.
    d. Refer to Drawings for special nailing requirements.

3.4 CORRECTION OF DEFECTIVE WORK

A. Remove and replace sheathing **and underlayment** panels with edges split or damaged by fasteners.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes:

1. Exterior standing and running trim.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Section 07 92 00: Joint Sealants
2. Section 09 90 00: Painting, priming and back priming of finish carpentry.

1.2 SUBMITTALS

A. Product Data: For each type of product, process and factory fabricated product.

1. Include data for wood preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
2. For water-borne-treated products include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Experienced Installer who has completed finish carpentry similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

1.4 DELIVERY, STORAGE, AND HANDLING

A Delivery and Storage: Protect materials against weather and contact with damp or wet surfaces.

1.5 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installing exterior finish carpentry only when existing and forecasted weather conditions will permit work to be performed according to manufacturer's recommendations and warranty requirements and at least one coat of specified finish to be applied without exposure to rain, snow, or dampness.

1.6 COORDINATION

A. Coordinate sizes and locations of framing, blocking, reinforcements, and other related items of Work specified in other Sections to ensure that exterior woodwork can be supported and installed as indicated.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by American Lumber Standards' Committee Board of Review.

B. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps entirely and provide certificates of grade compliance issued by inspection agency.

C. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:

1. WCLIB - West Coast Lumber Inspection Bureau.
2. WWPA - Western Wood Products Association.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Water Repellant Preservative Treatment by Non-pressure Process: AWPA N1.

1. Preservative Chemicals: 3-iodo-2-propynyl butyl carbamate (IPBC).
2. Use chemical formulations that do not bleed through or otherwise adversely affect finishes.
3. Do not use colorants in solution to distinguish treated material from untreated material.
4. Application: Where indicated.

B. Preservative Treatment by Pressure Process: Comply with AWPA C2 (lumber) and AWPA C9 (plywood) except that lumber that is not in contact with ground and is continuously protected from liquid water many be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Pressure-impregnate woodwork with preservative chemicals acceptable to authorities having jurisdiction.
2. Do not use chemical formulations that require incising.
3. For exposed items indicated to receive transparent finish, do not use chemical formulations that bleed through or otherwise adversely affect finishes.
4. Kiln-dry material after treatment to levels required for untreated material. Do not use material that is warped or does not comply with requirements for untreated material.
5. Do not use chemicals containing chromium or arsenic.
6. Application: Where indicated.

C. Acceptable Products:

1. Nisus Corporation: BORA-CARE Wood Preservative.
2. Chemical Specialties, Inc.: ACQ Preserve Plus.
3. Substitutions: Submit in accordance with requirements of Section 01 2500.

2.3 FABRICATION

A. Wood Moisture Content: 9 to 15 percent.

B. Fabricate finish carpentry to dimensions, profiles, and details indicated.

2.4 EXTERIOR STANDING AND RUNNING TRIM

A. Lumber Trim: Provide finished lumber complying with the following requirements including those of the grading agency listed with species:

1. Species: Western red cedar.

a. WCLIB: Cedar Industrial Clears; Grade B and Better.
b. WWPA: Grade B.

2. Lumber: Solid lumber stock.

B. Back out or groove backs of flat trim members and kerf backs of other wide, flat members, except members with ends exposed in finished work.

2.5 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Provide nails of the following materials, in sufficient length to penetrate minimum of 1-1/2 inches into substrate, unless otherwise recommended by manufacturer.

1. Stainless steel.
2. Hot-dip galvanized steel.
3. Aluminum.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage.

1. Provide nonferrous metal or hot-dip galvanized anchors and inserts, unless otherwise indicated.
2. Provide toothed steel or lead expansion sleeves for drilled-in-place anchors.

C. Flashing: Comply with requirements of Section 07 6000 for flashing materials installed in finish carpentry.

D. Sealant: Comply with requirements of Section 07 9200 for materials required for sealing exterior woodwork.

2.6 FINISHES

A. General: Paint as specified in Section 09 9000, “Painting,” for exterior wood.

B. Apply one coat of sealer or primer compatible with finish coats to concealed surfaces of exterior finish carpentry. Apply two coats to end-grain surfaces.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting installation and performance of finish carpentry.

3.2 PREPARATION

A. Prime and back prime lumber for painted finish exposed on the exterior. Comply with requirements for surface preparation and application in Section 09 90 00, “Painting.”

3.3 INSTALLATION, GENERAL

A. Do not use finish carpentry materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

B. Install finish carpentry plumb, level, true, and aligned with adjacent materials. Use concealed shims where required for alignment.

1. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Countersink nails, fill surface flush, and sand where face nailing is unavoidable.
3. Install to tolerance of 1/8 inch in 96 inches for plumb and level. Install adjoining finish carpentry with 1/32 inch maximum offset for flush installation and 1/16 inch maximum offset for reveal installation.
4. Coordinate finish carpentry with materials and systems in or adjacent to standing and running trim. Provide cutouts for mechanical and electrical items that penetrate exposed surfaces of finish carpentry components.
5. Provide cutouts for mechanical and electrical items that penetrate exposed surfaces of finish carpentry components.

C. Preservative Treated Wood: Where cut or drilled in field, treat cut ends and drilled holes according to AWPA M4.

D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk concealed fasteners and blind nailing. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork.

E. Finish: Finish according to specified requirements.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available.

1. Do not use pieces less than 36 inches long, except where necessary. Scarf running joints and stagger in adjacent and related members.
2. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint.
3. Use scarf joints for end-to-end joints.

B. Fit exterior joints to exclude water. Apply flat grain lumber with bark side exposed to weather.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes the following:

1. Blanket insulation.
2. Vapor retarders.

B. Unit Prices: Work of this Section is based on unit-price for thermal insulation replacement, authorized under provisions of Section 0 22 00, “Unit Prices.”

1.2 PERFORMANCE REQUIREMENTS

A. Provide with materials of this Section a continuity of thermal and vapor barrier at building enclosure elements.

1.3 SUBMITTALS

A. Product Data: For each type of building insulation and vapor retarder specified.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined per test method indicated below:

1. Surface-Burning Characteristics: ASTM E 84.
2. Fire-Resistive Ratings: ASTM E 119.
3. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources.

B. Store inside and in a dry location.

C. Comply with manufacturer’s instructions for handling, storing, and protecting during installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the manufacturers specified in PART 2 Articles

2.2 BLANKET INSULATION MATERIALS

A. Faced Blanket Insulation:

1. Manufacturers:

a. CertainTeed Corporation.
b. Johns Manville Corporation.

c. Owens Corning.

2. ASTM C 665, Type II, Class C, Category I.
3. Type: Glass-fiber.
4. Vapor Retarder: Kraft, with 1.0 maximum permeability.
5. Provide min. 1 inch wide flange along edges for attachment to framing
6. Thickness: Equal to existing insulation replaced.

B. Unfaced Blanket Insulation:

1. Manufacturers:

a. CertainTeed Corporation.
b. Johns Manville Corporation.
c. Owens Corning.

2. ASTM C 665, Type I.
3. Type: Glass-fiber.
4. Surface Burning Characteristics: Class A, Flame spread 25 and smoke development 50 per ASTM E 84; rated as noncombustible per ASTM E 136.
6. Thickness: Equal to existing insulation replaced.

2.3 VAPOR RETARDERS

A. LAMTEC Corporation: "LAMTEC" WMP-VR, PSK-LD white polypropylene film fiberglass and polyester scrim, 11# natural kraft, with permeance rating of 0.09 perm.

2.4 ACCESSORIES

A. Vapor-Retarder Tape: Pressure sensitive tape of type recommended by insulation manufacturer for sealing joints and penetrations in vapor retarder facings.

B. Wire Mesh: Galvanized steel, hexagonal wire mesh, minimum 18 gage.

C. Adhesives: Type for insulation or vapor retarders as recommended by material manufacturer for bonding to substrates indicated.

D. Fasteners and Adhesives: As recommended by insulation manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrates and conditions for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

B. Coordinate as required with other trades to assure proper and adequate provision in Work of this Section.

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.

C. Extend insulation in thickness indicated to envelope entire area to be insulated. Cut and fit around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates by method indicated, or if no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Install vapor retarding faced units with vapor retarder to warm side of assembly.

1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
2. Tape seal butt ends, lapped flanges, and tears or cuts in membrane to form a continuous barrier.
3. Where separate sheet vapor barrier is used, place on warm side of insulation, and lap and seal sheet barrier joints over framing member face.

C. Install mineral-fiber insulation in cavities formed by framing members as follows:

1. Use blanket widths and lengths that completely fill cavities formed by framing members.
2. Place insulation cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Cut and fit tightly around obstructions and fill voids with insulation.
4. Place insulation between pipes in wall and exterior side of assembly. Leave no gaps or voids.
5. Maintain 3 inch clearance of insulation around recessed lighting fixtures.
6. For wood framed construction, install insulation blankets according to ASTM C 1320 and as follows:

a. With faced blankets having stapled flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

3.5 INSTALLATION OF VAPOR RETARDERS

A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission.

1. Secure in place with adhesives or other anchorage system.

2. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose fiber insulation.

B. Wood Framing: Seal vertical joints in vapor retarders over framing. Fasten vapor retarders to framing at top, end and bottom edges; at perimeter wall openings; and at lap joints.

C. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor retarder tape to create an airtight seal between penetrating objects and vapor retarder.

D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor retarder taper or another layer of vapor retarder.

3.6 PROTECTION

A. Protect installed insulation and vapor retarders from damage, both from weather exposure or construction operations.

B. Repair damaged insulation and vapor retarders.

END OF SECTION

PART 1 - GENERAL

1.01 Description:

A. Provide and install Fiberglass Shingle Roofing system as indicated on Drawings and specified herein.

1.02 Related Work Specified Elsewhere:

A. Section 06 16 00; Sheathing
B. Section 07 60 00; Flashing and Sheet Metal

1.03 Standards:

A. Comply with Section 01 60 00 Product Requirements.

1.04 Submittals:

A. Samples: submit two samples of shingles indicating manufacturer's standard full color range for selection.

B. Product Data: Manufacturer's material description and installation instructions.

C. Submit in accordance with Section 01 25 00 Submittals and Substitutions.

1.05 Warranty:

A. Provide Owner with manufacturer's standard prorated warranty for materials and notarized applicator warranty against roofing and flashing defects for 2 years. The warranty shall provide for repairs of roofing and flashing under this Section where leaking occurs due to faulty materials and / or workmanship.

1.06 Handling and Storage:

A. Deliver materials with manufacturer's label intact and legible in sealed packages with U.L. labels. Store materials on raised platforms in protected locations and provide moisture and temperature protection. Do not stack bundles of shingles more than 4 feet high. Store rolled good on end.

1.07 Job Conditions:

A. Install no underlayment or shingles on wet surfaces. Underlayment and shingles may be installed over roof sheathing after the sheathing has been allowed to air dry for a minimum of a few hours after rain to allow surface water to be removed. Apply no shingles when air temperature is below 40 degrees F or is expected to be below 40 degrees F anytime within 24 hours of shingle installation. Comply with manufacturer's written instructions.

PART 2-PRODUCTS

2.01 Approved Manufacturers:

A. Owens Corning

2.02 Materials:

A. Fiberglass Shingles: Fiberglass Base, Asphalt shingles, square butt: 3 tabs, U.L. Class A Fire Resistant, U.L. Wind Resistance, 20-year warranty, Self sealing. ASTM D-3018-90 Type 1 and ASTM D 3462-87. Approved or equal fiberglass shingles: Owens Corning 20-year Classic. Color: Onxy Black, metric sized 13-1/8-inch x 39-3/8-inch, exposure 5-6/16-inch.

B. Asphalt saturated roofing felt: A.S.T.M. D-226-82, Type 15, organic, unperforated, 36 inches wide.

C. Mineral Surfaced Cap Sheet: 90 pound mineral surface roll, 36-inches wide.

D. Hip and ridge shingles: Job cut or pre-cut manufacturer's standard.

E. Nails: Hot galvanized or aluminum 11 or 12 gauge barbed shank, 3/8" head, sharp pointed conventional, of sufficient length to penetrate through plywood sheathing.

F. Staples: Corrosion resistant in compliance with manufacturer's specifications.

G. Bituminous Plastic Cement: ASTM D-2822-82, Conmastic by Conglas, #702 and #703 by Malarkey, Industrial Roof Cement by Manville, Plastic Cement by Owens-Corning or equal.

H. Sloping Roof Vents:

1. Slant Black, black polypropylene construction with corrosion resistant insect screening, 61 square inches free vent area each. RV-61-Black Airhawk Roof Vent manufactured by Solar Group or approved equal.

I. Continuous Ridge Vents:

1. 18 sq. inches net free vent area per lineal foot;

a. Shingle Vent II #SHFV203, with end plugs and connector plugs by Air Vent Inc.

J. Plumbing Vent Pipe Flashings: Provided by Mechanical Contractor.

K. Flashings: Provide in accordance with Section 07 60 00 Flashings and Sheet Metal.

L. Mechanical Vent Caps: Provided by Mechanical Contractor.

PART 3-EXECUTION

3.01 Inspection by Contractor:

A. Assure that surfaces to which shingles are to be applied are uniform, smooth, sound, clean, dry and free of irregularities. Inspect the nailing of roof sheathing to ensure that nail heads are flush with surface and nailing is complete. Remove any debris including sawdust from the roof surface. Inspect the roof surface to ensure that the sheathing surface is true and level at eaves and rakes. Do not start work until unsatisfactory conditions are corrected.

B. Application of asphalt shingle roof over working of other trades shall constitute acceptance of such work and / or surfaces. Do not start work until unsatisfactory conditions are corrected.

C. Verify that any work of other trades which penetrates roof deck has been completed.

3.02 Application:

A. Apply underlayment and shingles in strict accordance with manufacturer's instructions.

B. Valleys: Install roofing shingles in valleys in a woven pattern. Install a single layer of Mineral Surfaced Cap Sheet, mineral surface up, centered in the valley. Install shingles extending each shingle at least 12-inches beyond center of valley.

C. Provide 1/4-inch to 3/8-inch shingle overhang at eave. Install shingles over asphalt saturated roofing felt underlayment with 4 fasteners per shingle. Provide 5-inch exposure for 12-inch x 36-inch shingles and 5-5/8-inch exposure for 13-1/4-inch x 39-3/8-inch shingles.

D. Eave and Rake Flashing: Install sheet metal flashing drip edge over underlayment along eaves. Lap end joints 6-inch minimum. Nail eave flashing to the roof sheathing at 8 to 10-inches on center with corrosion resistant fasteners.

E. Install sloped roof vents and ridge roof vents as shown on Drawings and in accordance with UBC roof ventilation requirements and manufacturer's written instructions. Provide minimum 1 square foot of total net free ventilating area for each 150 square feet of ventilated space. Align sloping roof vents horizontally and vertically for neat appearance. Verify exact location with Architect. Cut and trim roofing shingles to fit within 1-inch around vents. Seal shingles with asphalt plastic cement above and on sides of vents as required to provide a weather tight installation. Install ridge vents in continuous bead of asphalt plastic cement as required to seal any gap between the shingles and the ridge vent.

F. Install pre-formed flashing and flanges at all vent pipes in accordance with manufacturer's instructions. Cut and trim roofing shingles to fit within 1-inch around vents. Seal shingles with asphalt plastic cement above and on sides of vents as required to provide a weather tight installation.

G. Install Mechanical vent caps in accordance with manufacturer's instructions.

H. Keep equipment over 400 lbs. off roof. Stock materials over beam supports.

3.03 Adjust and Clean:

A. Replace all damaged shingles.

B. Remove excess shingles and debris from project site. Clean gutters of any debris.

C. After shingle installation, inspect shingles to verify tabs have self-sealed properly. If self-seal has not been achieved, seal tabs of shingles with hand application of shingles tab cement under each tab.

END OF SECTION

PART 1 - GENERAL CONDITIONS

1.01 DESCRIPTION

A. Scope

1. Remove the existing roof system and all of its components down to the existing concrete substrate.

2. Prepare and repair existing concrete substrate to receive new layer Sarnavap SA self-adhered vapor barrier. Provide and Install new layer of Sarnavap SA Self Adhered Vapor per PVC manufacturer's detail and installation requirements.

3. Provide and install new layers of rigid polyisocyanurate insulation equaling R-38. Stagger all joints and fully adhered with approved low-rise polyurethane foam adhesive per approved PVC manufacturer's installation and detail requirements and the following specification and conforming to FM 1-90 attachment requirements.

4. Provide and install new layer of ½" Dens Deck Prime over newly installed rigid insulation and rigid tapered insulation. Stagger all joints and fully adhere new ½" Dens Deck Prime with approved low-rise polyurethane foam adhesive per the approved PVC membrane manufacturer's installation and detail requirements and the following specifications and conforming to FM 1-90 wind uplift requirements.

4. Provide and install a new adhered 60 mil Single Ply Thermoplastic (PVC) Roofing Membrane
along with flashings and other components to comprise a roofing system per the following specifications. Membrane color shall be Energy Smart White.

5. Install a new clad metal detail at perimeter edge where required per the following specification and detail requirements. Install per PVC manufacturer's detail and installation requirements.

   Install new surface mounted counter flashing where required. Install per PVC manufacturer's detail and installation requirements.

6. At all A/C or Mechanical unit access areas, install new PVC Crossgrip walkway. Install per PVC manufacturer's recommended detail and installation requirements.

7. Flash each penetration with a cone flashing membrane per PVC manufacture's standard written and detail requirements. Any and all pitch pans are to be removed and each penetration flashed individually.

B. Related Work

The work includes but is not necessarily limited to the installation of:

1. Roofing and Insulation Installation
2. Substrate Preparation
3. Roof Drains

4. Wood Blocking
5. Insulation
6. Separation Layers
7. Roof Membrane
8. Fasteners
9. Adhesive for Flashings
10. Roof Membrane Flashings
11. Walkways
12. Metal Flashings
13. Sealants

C. Upon successful completion of work the following warranties may be obtained:

1. Manufacturer Warranty – 20 Year Systems Warranty “No Dollar Limit”
2. Roofing Contractor Warranty – 5 Year

1.02 QUALITY ASSURANCE

A. The roofing system shall be applied only by a Roofing Contractor authorized by the Manufacturer prior to bid ("Applicator"). The Roofing Contractor shall have at least five (5) years of experience as an applicator with the submitted manufacturer as certified by the manufacturer.

B. Upon completion of the installation and the delivery to the Manufacturer by the Applicator of a certification that all work has been done in strict accordance with the contract specifications and the Manufacturer’s requirements, an inspection shall be made by a Technical Representative of the Manufacturer to review the installed roof system.

C. There shall be no deviation made from the Project Specification or the approved shop drawings without prior written approval by the Owner, the Owner’s Representative and the approved PVC Membrane Manufacturer.

D. All work pertaining to the installation of the membrane and flashings, shall only be completed by Applicator’s personnel trained and authorized by the Manufacturer in those procedures.

E. Membrane to have no formulation changes in the last fifteen (15) years as certified by the manufacturer. No private labeled membrane products will be accepted or reviewed.

F. Unreinforced or polyester reinforced membrane base flashings are prohibited.

G. PVC Membrane Manufacturer’s warranty shall “No Dollar Limit” for the replacement of defective materials and/or labor and shall not contain any exclusion for ponding water.

H. PVC Membrane Manufacturer shall submit third party test data documenting the proposed equal has a membrane “polymer thickness” within two (2) mils of the specified mil thickness, ASTM (+/-) mil tolerances are not accepted.

I. PVC Membrane Manufacturer must have an established program for recycling membrane at the end of its useful life. The membrane manufacture must provide three (3) instances in which they have done so.

J. PVC Membrane Manufacturer to confirm in writing that they directly manufacture the roofing membrane (private labeled membranes are no acceptable)

1.03 SUBMITTALS

All submittals which do not conform to the following requirements, will be rejected.

A. SUBMITTALS WITH BID

1. A list of each primary component to be used in the roof system and the Manufacturer's current literature for each component.

2. Sample copy of Contractor's warranty.

3. Letter from Roofing Manufacturer confirming that the Contractor is an authorized applicator of the specified roof system.

B. SUBMITTALS OF EQUALS

Submit proposed equals to be considered for use on this project no less than ten (10) days prior to bid date. Proposed roof systems, which have been reviewed and accepted will be listed in an addendum prior to bid date; only then will roof systems be accepted at bidding.

Submittals shall include the following:

A. Copies of Specification including physical properties.

B. Samples of each primary component to be used in the roof system and the manufacturer's current literature for each component.

C. Written approval by the insulation manufacturer (as applicable) for use and performance of the product in the proposed system.

D. Sample copy of Manufacturer's warranty including no exclusion for ponding water and no time limit shall be assigned to any such ponding water.

E. Sample copy of Applicator's warranty.

F. Certifications by manufacturers of roofing and insulating materials that all materials supplied comply with all requirements of the identified ASTM and industry standards or practices and requirements of this specification as stated in Section 2.01, C & D and Quality Assurance. Copy of the ASTM Certification for the named product showing the Type II Class I fiberglass reinforced roofing membrane.

G. Certification from the Applicator that the system specified meets all identified code and insurance requirements as required by the Specification.

H. Letter from the proposed manufacturer confirming the number of years it has DIRECTLY manufactured the proposed roof system under the trade names and/or trademarks as proposed. No private labeled products/membranes will be accepted or reviewed.

I. Material Safety Data Sheets (MSDS)

J. Written Confirmation from a corporate officer of the roofing system manufacturer that the membrane manufacturer has initiated a post consumer recycle program.

1.04 CODE REQUIREMENTS

The applicator shall submit evidence that the proposed roof system meets the requirements of the local building code and has been tested and approved or listed by the following test organizations. These requirements are minimum standards and no roofing work shall commence without written documentation of the system's compliance, as required in the "Submittals" section of this specification.

A. Factory Mutual Research Corporation (FM) - Norwood, MA

1. Class 1-90 (attachment requirements only)

B. Underwriters Laboratories, Inc. - Northbrook, IL

1. Class A assembly

C. California Title 24 Part 6: Roof Membrane (not post installation applied finish) must comply with current minimum 3-year aged solar reflectance of 0.55 and a minimum thermal emittance of .75.

D. Field and Flashing membrane shall conform to ASTM D4434 (latest version), Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type II Grade I.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. All products delivered to the job site shall be in the original unopened containers or wrappings bearing all seals and approvals.

B. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.

C. Membrane rolls shall be stored lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not accepted due to the accumulation of moisture beneath the tarpaulin in certain weather conditions that may affect the ease of membrane weldability.

D. All adhesives shall be stored at temperatures between 40º F (5º C) and 80º F (27º C).

E. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.

F. All materials which are determined, by the Owner's Representative or the manufacturer to be damaged are to be removed from the job site and replaced at no cost to the Owner.

1.06 JOB CONDITIONS

A. Membrane materials may be installed under certain adverse weather conditions but only after consultation with the Manufacturer and Owner's Representative, as installation time and system integrity may be affected.

B. Only as much of the new roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams shall be cleaned and heat welded before leaving the job site that day.

C. All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.

D. All surfaces to receive new insulation, membrane or flashings shall be dry. Should surface moisture occur, the Applicator shall provide the necessary equipment to dry the surface prior to application.

E. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.

F. Uninterrupted waterstops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.

G. The Applicator is cautioned that certain membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Such materials shall not remain in contact with the membranes. The Applicator shall consult the manufacturer regarding compatibility, precautions and recommendations.

H. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Applicator shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A substantial protection layer consisting of plywood over Felt or plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.

I. Prior to and during application, all dirt, debris and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air and/or similar methods.

J. The Applicator shall follow all safety regulations as required by OSHA and any other applicable authority having jurisdiction.

K. All roofing, insulation, flashings and metal work removed during construction shall be immediately taken off site to a legal dumping area authorized to receive such materials. Hazardous materials, such as materials containing asbestos, are to be removed and disposed of in strict accordance with applicable City, State and Federal requirements.

L. All new roofing waste material (i.e., scrap roof membrane, empty cans of adhesive) shall be immediately removed from the site by the Applicator and properly transported to a legal dumping area authorized to receive such material.

M. The Applicator shall take precautions that storage and/or application of materials and/or equipment does not overload the roof deck or building structure.

N. Installation of the membrane over coal tar pitch or a re-saturated roof requires special consideration to protect the membrane from volatile fumes and materials. Consult the manufacturer for precautions prior to bid.

O. Flammable adhesives and deck primers shall not be stored and not be used in the vicinity of open flames, sparks and excessive heat.

P. All rooftop contamination that is anticipated or that is occurring shall be reported to the manufacturer to determine the corrective steps to be taken.

Q. The Applicator shall verify that all roof drain lines are functioning correctly (not clogged or blocked) before starting work. Applicator shall report any such blockages in writing (letter copy to the manufacturer) to the Owner's Representative for corrective action prior to installation of the roof system.

R. Applicator shall immediately stop work if any unusual or concealed condition is discovered and shall immediately notify Owner of such condition in writing for correction at the Owner's expense (letter copy to the manufacturer).

S. Site cleanup, including both interior and exterior building areas that have been affected by construction, shall be completed to the Owner's satisfaction.

T. All landscaped areas damaged by construction activities shall be repaired at no cost to the Owner.

U. The Applicator shall conduct fastener pullout tests in accordance with the latest revision of the SPRI/ANSI Fastener Pullout Standard to help verify condition of deck/substrate and to confirm expected pullout values.

V. The adhered membrane shall not be installed under the following conditions without consulting the manufacturer’s technical department for precautionary steps:

1. The roof assembly permits interior air to pressurize the membrane underside.
2. Any exterior wall has 10% or more of the surface area comprised of opening doors or windows.
3. The wall/deck intersection permits air entry into the wall flashing area.

W. Precautions shall be taken when using adhesives at or near rooftop vents or air intakes. Adhesive odors could enter the building. Coordinate the operation of vents and air intakes in such a manner as to avoid the intake of adhesive odor while ventilating the building. Keep lids on unused cans at all times.

X. Protective wear shall be worn when using solvents or adhesives or as required by job conditions.

1.07 BIDDING REQUIREMENTS

A. Pre-Bid Meeting:

A pre-bid meeting shall be held with the Owner's Representative and involved trades to discuss all aspects of the project. The Applicator's field representative or roofing foreman for the work shall be in attendance. Procedures to avoid rooftop damage by other trades shall be determined.

B. Site Visit:

Bidders shall visit the site and carefully examine the areas in question as to conditions that may affect proper execution of the work. All dimensions and quantities shall be determined or verified by the contractor. No claims for extra costs will be allowed because of lack of full knowledge of the existing conditions unless agreed to in advance with the Owner or Owner's Representative.

1.08 WARRANTIES

A. 20 Year Systems Warranty (only products purchased from the membrane manufacturer are covered under System Warranty)

Upon successful completion of the work to the Roofing Manufacturer's and Owner's satisfaction, and receipt of final payment, the twenty (20) Year Systems Warranty shall be issued. The System Warranty shall provide for the roof membrane, all accessories that comprise a roof system, and contractor labor. The Warranty shall be Non-Prorated provide for No Dollar Limit (NDL) and shall not exclude ponding water and no time limited shall be assigned for any such ponding water during the warranty period.

B. Applicator/Roofing Contractor Warranty

The Applicator shall supply the Owner with a separate five-year workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within the Applicator warranty term, defective or otherwise not in accordance with the Contract Documents, the Applicator shall repair that defect at no cost to the Owner. The Applicator's warranty obligation shall run directly to the Owner, and a copy shall be sent to the manufacturer.

C. Owner Responsibility

Owner shall notify both the manufacturer and the Applicator of any leaks as they occur during the time period when both warranties are in effect.

PART 2 - PRODUCTS

2.01 GENERAL

A. The components of the Adhered roof system are to be products of the membrane manufacturer as indicated on the Detail Drawings and specified in the Contract Documents.

B. Components to be used, that are other than those, supplied or manufactured by the membrane manufacturer may be submitted for review and acceptance by the manufacturer. The manufacturer's acceptance of any other product is only for a determination of compatibility with membrane products and not for inclusion in the manufacturer's warranty. The specifications, installation instructions, limitations, and/or restrictions of the respective manufacturers must be reviewed by the Owner's Representative for acceptability for the intended use with the manufacturer's products.

C. Membrane shall be certified by the manufacturer to be within two (2) mils of the specified membrane thickness as stated in this section. ASTM minimum standards of +/- 10% will not be accepted.

2.02 MEMBRANE

A. Basis of Design - Sika Sarnafil® G410 fiberglass reinforced membrane with a factory-applied integral lacquer coating to repel dirt and sustain reflectivity.

B. Membrane shall conform to ASTM D4434-96 (or latest revision), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type II, Grade I.

1. Sika Sarnafil G410, 60 mil, thermoplastic membrane with fiberglass reinforcement.
2. Or Pre-Approved Equal.

C. Color of Membrane

1. EnergySmart (white), initial reflectivity of 0.83, initial emissivity 0.90, solar reflective index (SRI) of >104.
2. Other standard colors as selected by architect.

Typical Physical Properties

TECHNICAL DATA TYPICAL PHYSICAL PROPERTIES*

Property	ASTM Test Method	ASTM Type II D-4434 Spec. Requirement	Typical Results
Overall Thickness, mil	D751	45	60
Thickness Over Scrim, mil	--	16	27
Reinforcing Material	--	--	Fiberglass
Breaking Strength, lbf/in (N)	D751	55 (245)	80 (356)
Elongation at Break, % M. D.[1] & C.M.D.[1]	D751	250 & 220	250 & 220
Seam Strength, % of original[2]	D751	75	Pass
Retention of Properties After Heat Aging	D3045	--	--
Tensile Strength, % of original	D751	90	Pass
Elongation, % of original	D751	90	Pass
Tearing Resistance, lbf (N)	D1004	10 (45)	17.5 (78)
Low Temperature Bend, -40°F (-40°C)	D2136	Pass	Pass
Accelerated Weathering Test, Hours (Florescent Light UV exposure)	G154	5,000	10,000
Cracking (7x magnification)	--	None	None
Discoloration (by observation)	--	Negligible	Negligible
Crazing (7x magnification)	--	None	None
Linear Dimensional Change, %	D1204	0.1	-0.02
Weight Change After Immersion in Water, %	D570	± 3.0	1.9
Static Puncture Resistance, lbf (kg)	D5602	33 (15)	Pass
Dynamic Puncture Resistance, ft-lbf (J)	D5635	7.3 (10)	Pass

* Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions, and curing conditions.

1 M.D. = Machine Direction, C.M.D. = Cross Machine Direction

2 Failure occurs through membrane rupture not seam failure.

2.03 FLASHING MATERIALS

A. Wall/Curb Flashing

1. Flashing Membrane

A fiberglass reinforced membrane adhered to approved substrate using adhesive.

2. Clad

PVC-coated, heat-weldable sheet metal, capable of being formed into a variety of shapes and profiles. Clad is a 25 gauge, G90 galvanized metal sheet with a 20 mil (1 mm) unsupported membrane laminated on one side.

B. Miscellaneous Flashing

1. Stack – Membrane Prefabricated Pipe Flashing

A prefabricated vent pipe flashing made from 0.048 inch (48 mil/1.2 mm) thick G410 membrane.

2. Circle-"G"

Circular 0.048 inch (48 mil/1.2 mm) thick G410 membrane patch welded over T-joints formed by overlapping thick membranes.

3. Corner

Prefabricated outside and inside flashing corners made of 0.060 inch (60 mil/1.5 mm) thick membrane that are heat-welded to membrane or Clad base flashings. Corner is available in 2 outside sizes (5 inch and 8½ inch diameter/127 mm and 215 mm) and 1 inside size.

4. Multi-Purpose Sealant

A sealant used at flashing terminations.

5. Flashing Adhesive

A solvent-based reactivating-type adhesive used to attach membrane to flashing substrate.

6. Self Adhered Vapor Barrier

A 32-mil self adhered vapor barrier that can also serve as temporary roof protection. Self Adhered Vapor Barrier is available in rolls 44.9 inches x 133.8 feet.

2.04 INSULATION & SEPARATION BOARD

A. Dens-Deck Prime – 1/2” thickness

Siliconized gypsum, fire-tested hardboard with glass-mat facers. Dens-Deck is provided in a 4 ft x 8 ft (1.2 m x 2.4 m) board size and in thicknesses of ½ inch.

B. Rigid Insulation – R=38 installed in a minimum of two (2) layers 2 ½" and 4".
Rigid polyisocyanurate foam insulation, with black mat facers, 20 psi. Consult product data sheet for additional information.

2.05 ATTACHMENT COMPONENTS

A. Membrane adhesive

1. Water Based Adhesive: Field Membrane

A water-based adhesive used to attach the membrane to horizontal or near-horizontal substrates. Application rates are as follows:

APPLICATION RATES FOR FELTBACK MEMBRANE						
	Adhesive Rates - Gallons/100 Ft² (Liters/Meter²)					Approximate Sq. Ft./Pail (meter²)
	Substrate		Membrane		Total	
Isocyanurate facer	1.75 (0.71)	+	0	=	1.75 (0.71)	285 (26.48)
Smooth plywood	1.75 (0.71)	+	0	=	1.75 (0.71)	285 (26.48)
Concrete deck	2.00 (0.81)	+	0	=	2.00 (0.81)	250 (23.23)
Cellular concrete	2.00 (0.81)	+	0	=	2.00 (0.81)	250 (23.23)
GP Dens-Deck®	1.75 (0.71)	+	0	=	1.75 (0.71)	285 (26.48)
GP Dens-Deck Prime®	1.50 (0.61)	+	0	=	1.50 (0.61)	333 (30.94)

Notes:

a) There is a significant increase in drying time due to an increase in humidity and/or a decrease in temperature. Do not install when outdoor or substrate temperatures during drying period are expected to fall below 40º F (5º C).
b) Do not allow water-based adhesive to skin-over or surface-dry prior to installation of membrane.
c) Use a water-filled, foam-covered lawn roller to consistently and evenly press the membrane into the adhesive layer.

B.

Notes:

a) Adhesive must be applied as a continuous layer.
b) Use a water-filled, foam-covered lawn roller to consistently and evenly press insulation into adhesive layer.
c) Storage temperatures in excess of 90° F (32° C) may affect shelf life.
d) If exposed to temperatures below 40° F (5° C), restored to a minimum temperature of 60°F (15° C) before use.
e) Job site conditions may affect performance. Adhesive shall not be used if surface and/or ambient temperatures below 40° F (5° C) are expected during application or subsequent curing time.
f) Adhesive shall not be applied to wet or damp surfaces.

C. Fastener XP

A #15, heavy duty, corrosion resistant fastener used with peel-stop and bar to attach PVC membrane to steel or wood decks. Fastener XP has a shank diameter of approximately .21 inch (5.3 mm) and the thread diameter is approximately .26 inch (6.6 mm). The driving head has a diameter of approximately .435 inch (11 mm) with #3 Phillips recess to for positive engagement.

D. Peel Stop

An extruded aluminum, low profile bar used with certain fasteners to attach to the roof deck or to walls/curbs at terminations, penetrations and at incline changes of the substrate. Stop is a 1 inch (25 mm) wide, flat aluminum bar 1/8 inch (3 mm) thick that has predrilled holes every 6 inches (152 mm) on center.

E. Insulation Board Adhesive

1. OM Adhesive

A two component (part A and B) low rise polyurethane foam used to attach insulation to approved compatible substrates. Adhesive is applied with a pace cart in bands 12 inches on center. Application rates are typically one gallon per square. Additional adhesive may be required for rougher surfaces.

2. AD Adhesive:

A one step low-rise polyurethane foam used to attach insulation to approved compatible substrates. Adhesive is applied with a gravity fed applicator or by hand with a dual component caulk gun in bands 12 inches on center. Additional adhesive may be required for rougher surfaces.

2.06 WALKWAY PROTECTION

A. Crossgrip Walkway

A rolled out reinforced protection mat used to protect PVC roofing membrane from mechanical abuse. Cross-grip Walkway is 9/16-inch thick flexible PVC with a heavily textured surface. The walk way is to be secured with loops of PVC membrane welded to the field sheet.

2.07 MISCELLANEOUS FASTENERS AND ANCHORS

A. All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel. Mixing metal types and methods of contact shall be assembled in such a manner as to avoid galvanic corrosion. Fasteners for attachment of metal to masonry shall be expansion type fasteners with stainless steel pins. All concrete fasteners and anchors shall have a minimum embedment of 1¼ inch (32 mm) and shall be approved for such use by the fastener manufacturer. All miscellaneous wood fasteners and anchors used for flashings shall have a minimum embedment of 1 inch (25 mm) and shall be approved for such use by the fastener manufacturer.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION CONFERENCE

A. The Applicator, Owner's Representative/Designer and Manufacturer(s) shall attend a pre-construction conference.

B. The meeting shall discuss all aspects of the project including but not limited to:

1. Safety
2. Set up
3. Construction schedule
4. Contract conditions
5. Coordination of the work

3.02 SUBSTRATE CONDITION

A. Applicator shall be responsible for acceptance or provision of proper substrate to receive new roofing materials.

B. Applicator shall verify that the work done under related sections meets the following conditions:

1. Roof drains and/or scuppers have been reconditioned and/or replaced and installed properly.
2. Roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
3. All surfaces are smooth and free of dirt, debris and incompatible materials.
4. All roof surfaces shall be free of water, ice and snow.

3.03 SUBSTRATE PREPARATION

The roof deck and construction must be structurally sound to provide support for the new roof system. The Applicator shall load materials on the rooftop in such a manner to eliminate risk of deck overload due to concentrated weight. The Owner's Representative shall ensure that the roof deck is secured to the structural framing according to local building code and in such a manner as to resist all anticipated wind loads in that location.

A. Re-roof

General Criteria

Only that amount of roofing and flashing which can be made weathertight with new materials during a one-day period or before the onset of inclement weather.

3.04 SUBSTRATE INSPECTION – INSULATION BOARD INSTALLATION

A. A dry, clean and smooth substrate shall be prepared to receive the Adhered roof system.

B. The Applicator shall inspect the substrate for defects such as excessive surface roughness, contamination, structural inadequacy, or any other condition that will adversely affect the quality of work.

C. The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.

D. All roof surfaces shall be free of water, ice and snow.

E. The membrane shall be applied over compatible and accepted substrates only.

F. INSULATION BOARD INSTALLATION:

OM Adhesive

1. Apply using a pace cart equipment over properly installed and prepared substrate in bands 12 inches on center. Allow to rise approximately 1/2”-3/4” inch. Lay separation boards in adhesive and walk into place to ensure full embedment. On roof slopes greater that ½ inch in 12 inches, begin adhering separation boards at low point and work upward to avoid slippage. One person should be designated to walk in, trim/slit and apply weight to all insulation boards to ensure adequate securement. Only areas that can be made completely water tight in the same day’s operation shall be coated.

AD Adhesive:

1. With a utility knife, cut away the plastic plugs from the adhesive mixing head. Attach a mixing tip to the threaded mixing head. Place the cartridge in the applicator. At the beginning of the tube, some the material should be pumped out initially to make sure of a proper mix. Apply using a gravity feed applicator or by hand with a dual component caulk gun over properly installed and prepared substrates in bands of 12 inches on center. Walk insulation boards into wet adhesive to ensure full embedment.

3.05 INSTALLATION OF ROOF MEMBRANE

The surface of the insulation or substrate shall be inspected prior to installation of the roof membrane. The substrate shall be clean, dry, free from debris and smooth with no surface roughness or contamination. Broken, delaminated, wet or damaged insulation boards shall be removed and replaced.

A. Water Based Adhesive:

1. Over the properly installed and prepared substrate, water-based adhesive shall be poured out of the pail and spread using notched ¼ inch x ¼ inch x ¼ inch (6 mm x 6 mm x 6 mm) rubber squeegees. The water-based adhesive shall be applied at a rate according to the manufacturer’s requirements. No adhesive is applied to the back of the PVC membrane. Do not allow adhesive to skin-over or surface-dry prior to installation of PVC membrane.

2. The PVC roof membrane is unrolled immediately into the wet water-based adhesive. Adjacent rolls overlap previous rolls by 3 inches (75 mm). This process is repeated throughout the roof area. Immediately after application into adhesive, each roll shall be pressed firmly into place with a water-filled, foam-covered lawn roller by frequent rolling in two directions. Do not allow adhesive to skin-over or surface-dry prior to installation of PVC membrane.

3. Weld PVC cover strips at all PVC membrane seams that do not have a factory selvage edge.

Notes:

a) Water based adhesive shall not be used if temperatures below 40º F (5º C) are expected during application or subsequent drying time.
b) No adhesive shall be applied in seam areas. All membrane shall be applied in the same manner.

3.06 HOT-AIR WELDING OF SEAM OVERLAPS

A. General

1. All seams shall be hot-air welded. Seam overlaps should be 3 inches (75 mm) wide when automatic machine-welding and 4 inches (100 mm) wide when hand-welding, except for certain details.

2. Welding equipment shall be provided by or approved by the manufacturer. All mechanics intending to use the equipment shall have successfully completed a training course provided by a Technical Representative prior to welding.

3. All membrane to be welded shall be clean and dry.

B. Hand-Welding

Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.

1. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.

2. The nozzle shall be inserted into the seam at a 45-degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow," the hand roller is positioned perpendicular to the nozzle and pressed lightly. For straight seams, the 1½ inch (40 mm) wide nozzle is recommended for use. For corners and compound connections, the ¾ inch (20 mm) wide nozzle shall be used.

C. Machine Welding

1. Machine welded seams are achieved by the use of automatic welding equipment. When using this equipment, the manufacturer’s instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated off the generator.

2. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

D. Quality Control of Welded Seams

1. The Applicator shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark grey material from the underside of the top membrane. On-site evaluation of welded seams shall be made daily by the Applicator to locations as directed by the Owner's Representative or a manufacturer's representative. One inch (25 mm) wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Applicator at no extra cost to the Owner.

3.07 MEMBRANE FLASHINGS

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and the manufacturer. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.

A. Adhesive for Membrane Flashings

1. Over the properly installed and prepared flashing substrate, adhesive shall be applied according to instructions found on the Product Data Sheet. The adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.

2. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.

B. Install Stop according to the Detail Drawings with approved fasteners into the structural deck at the base of parapets, walls and curbs. Stop is required by the manufacturer at the base of all tapered edge strips and at transitions, peaks, and valleys according to the manufacturer's details.

C. The manufacturer's requirements and recommendations and the specifications shall be followed. All material submittals shall have been accepted by the manufacturer prior to installation.

D. All flashings shall extend a minimum of 8 inches (0.2 m) above roofing level unless otherwise accepted in writing by the Owner's Representative and the Technical Department.

E. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place. No bitumen shall be in contact with the membrane.

F. All flashing membranes shall be mechanically fastened along the counter-flashed top edge with Stop at 6-8 inches (0.15-0.20 m) on center.

G. Flashings shall be terminated according to the manufacturer's recommended details.

H. All flashings that exceed 30 inches (0.75 m) in height shall receive additional securement. Consult Technical Department for securement methods.

3.08 CLAD METAL BASE FLASHINGS/EDGE METAL

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and the manufacturer. Acceptance shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.

A. Clad metal flashings shall be formed and installed per the Detail Drawings.

1. All metal flashings shall be fastened into solid wood nailers with two rows of post galvanized flat head annular ring nails, 4 inches (100 mm) on center staggered. Fasteners shall penetrate the nailer a minimum of 1 inch (25 mm).

2. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.

B. Adjacent sheets of Clad shall be spaced ¼ inch (6 mm) apart. The joint shall be covered with 2 inch (50 mm) wide aluminum tape. A 4-inch minimum (100 mm) wide strip of flashing membrane shall be hot-air welded over the joint.

3.09 WALKWAY INSTALLATION

A. Cross Grip Walkway

Roofing membrane to receive the Cross-Grip Walkway shall be clean and dry. Cross-grip Walkway is installed loose laid on top of completed PVC roof assemblies. Where design wind speeds exceed 94 mph. the walkway must be secured/welded with PVC membrane loops to newly installed PVC membrane.

Unroll and position Cross-grip Walkway within specified areas and cut to desired length. Do not install Cross-grip Walkway directly over securement bars. Securement clips are available for butting tow ends together.

3.10 TEMPORARY CUT-OFF

All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. All temporary waterstops shall be constructed to provide a 100% watertight seal. The stagger of the insulation joints shall be made even by installing partial panels of insulation. The new membrane shall be carried into the waterstop. The waterstop shall be sealed to the deck and/or substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed in a continuous heavy application of sealant as described in Section 2.10. When work resumes, the contaminated membrane shall be cut out. All sealant, contaminated membrane, insulation fillers, etc. shall be removed from the work area and properly disposed of off-site. None of these materials shall be used in the new work.

If inclement weather occurs while a temporary waterstop is in place, the Applicator shall provide the labor necessary to monitor the situation to maintain a watertight condition.

If any water is allowed to enter under the newly-completed roofing, the affected area shall be removed and replaced at the Applicator's expense.

3.11 COMPLETION

A. Prior to demobilization from the site, the work shall be reviewed by the Owner's Representative and the Applicator. All defects noted and non-compliances with the Specifications or the recommendations of the manufacturer shall be itemized in a punch list. These items must be corrected immediately by the Applicator to the satisfaction of the Owner's Representative and the manufacturer prior to demobilization.

B. All Warranties referenced in this Specification shall have been submitted and have been accepted at time of contract award.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes flashing and sheet metal and trim including, but not limited to, the following:

1. Roof drainage systems.
2. Exposed trim.
3. Metal flashing.
4. Reglets.
5. Flexible membrane flashing.

B. Related Sections:

1. Section 07 54 42: PVC Roofing, for flashing associated with single ply membrane.
2. Section 07 65 26: Self-Adhering Sheet Flashing, for flexible membrane flashing.
3. Section 07 92 00: Joint Sealants, for sealants.
4. Section 09 90 00: Painting, for field painting.

1.2 PERFORMANCE REQUIREMENTS

A. Provide sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples: For each type of prefinished item with specified or selected color.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed work similar in material, design, and extent to that indicated for this Project.

B. Fabrication Standard: Comply with applicable recommendations of SMACNA's “Architectural Sheet Metal Manual.”

1.5 PROJECT CONDITIONS

A. Coordination: Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

B. Field Measurements: Field verify dimensions prior to fabrication.

1.6 WARRANTY

A. Warrant Work of this Section to be watertight.

1. Warranty to cover repair of water leaks and resulting damage to building construction as may occur under normal usage within warranty period.
2. Include in warranty replacement of damaged materials that cannot be adequately repaired, as determined by the Architect.

PART 2 PRODUCTS

2.1 SHEET METALS

A. Prepainted, Metallic Coated Steel Sheet: Sheet steel metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653, G90 coating designation, structural quality.
2. Aluminum-Zinc Alloy Coated Steel Sheet: ASTM A 792, Class AZ50 coating designation, Grade 40, structural quality
3. Exposed Finish: Fluoropolymer 2-Coat thermocured system composed of inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2604.

a. Color and Gloss: As selected by Architect from manufacturer's full range of choices for color and gloss.
b. Resin Manufacturers:

1) Ausimont USA, Inc. (Hylar 5000).
2) Elf Atochem North America, Inc. (Kynar 500).

B. Stainless-Steel Sheet: ASTM A 240, Type 304, soft annealed, with No. 2D (dull, cold rolled) finish.

C. Aluminum Sheet: ASTM B 209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished with high-performance fluoropolymer coating; not less than 0.0359 inch uncoated thickness, unless otherwise indicated.

2.2 UNDERLAYMENT MATERIALS

A. Slip Sheet: Rosin-sized paper, minimum 5 lb./sq. ft.

B. Felts: ASTM D 226, Type II (No. 30), asphalt saturated organic felt, nonperforated.

C. Polyethylene Underlayment: ASTM D 4397, minimum 6 mil thick black polyethylene film.

2.3 FLEXIBLE MEMBRANE FLASHING

A. Flexible Membrane Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.

B. Acceptable Products: Subject to compliance with requirements provide one of the following products:

1. Fortifiber Building Products Systems: FortiFlash Waterproof Flashing, 40 mil.

C. Primer: Product recommended by manufacturer of flexible flashing for substrate.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and type of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners of non-corrosive metal designed to withstand design loads.

1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory applied coating.
2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.

C. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.

D. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing, permanently elastic, nonsag, nontoxic, and nonstaining.

E. Elastomeric Sealant: ASTM C 920, elastomeric silicone type specified in Section 07 92 00 by Dow Corning, GE, or approved.

F. Bituminous Coating: SSPC-Paint 12, cold-applied asphalt mastic, compounded for 15 mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

G. Reglets: Type and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces and compatible with flashing indicated.

1. Material: Stainless steel, unless otherwise indicated.
2. Manufacturer: Fry Reglet Corporation or approved.

H. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

I. Mechanical and Electrical Device Wall Penetration Flashing:

1. Quickflash Weatherproofing Products, Inc., or approved.

J. Preformed sill corner flashing.

K. Door sill pans fully soldered corner at upturn ends.

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item indicated.

B. Comply with details shown and as required to fit substrates and result in waterproof and weather-resistant performance when installed.

1. Fabricate in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

C. Form exposed sheet metal Work in longest lengths practicable, without excessive oil canning, buckling, and tool marks, and true to line and levels indicated.

1. Hem exposed edges, folded back minimum 1/2 inch.
2. Angle bottom edges of vertical surfaces to form drip.

D. Seams: Fabricate nonmoving seams from one of the following types. For non-aluminum materials, tin edges to be seamed, form seams, and solder.

1. Standing Seams: 3/4 inch, double lock.
2. Lap Seams: 3 inch finish width.
3. Solder-Lap Seams: 1 inch finish width; sweat full with solder.
4. S-Lock Seams: Form 1-1/4 inch wide ‘S’ shaped seam on one edge of flashing sheet for concealed fastening.
5. Cover Plate Seams: Not allowed, unless specifically approved by Architect for application.

E. Expansion Provisions: Form, fabricate and install sheet metal to provide for expansion and contraction in the finished Work.

1. Space movement joints at maximum of 10 feet with no joints allowed within 24 inches of corner or intersection.
2. Where lapped or bayonet type expansion provisions cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant concealed within joints.

F. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

G. Conceal fasteners and expansion provisions where possible.

1. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

H. Fabricate cleats and other attachment devices from same material and thickness as sheet metal component being anchored.

2.6 SHEET METAL FABRICATIONS

A. Gutters with Girth up to 15 Inches: Prepainted Metallic-Coated Steel: 0.0239 inch uncoated thickness (24 gage).

B. Downspouts: Prepainted Metallic-Coated Steel: 0.0239 inch uncoated thickness (24 gage).

C. Exposed Trim: Prepainted Metallic-Coated Steel: 0.0239 inch uncoated thickness (24 gage).

D. Base Flashing: Prepainted Metallic-Coated Steel: 0.0239 inch uncoated thickness (24 gage).

E. Counterflashing: Prepainted Metallic-Coated Steel: 0.0239 inch uncoated thickness (24 gage).

F. Cap Flashing: Prepainted Metallic-Coated Steel: 0.0239 inch uncoated thickness (24 gage).

G. Drip Edges: Prepainted Metallic-Coated Steel: 0.0239 inch uncoated thickness (24 gage).

H. Eave Flashing: Prepainted Metallic-Coated Steel: 0.0239 inch uncoated thickness (24 gage).

I. Roof Vent Pipe Flashing: Composite Material: Prepainted galvanized steel base with thermoplastic elastomer collar.

1. Product: Oatey, No-Caulk or approved.

2.7 FINISH

A. Provide prepainted, metallic coated steel sheet where indicated.

B. Field apply paint finish as specified in Section 09 9000 for items not prepainted.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, securely anchored, and are ready to receive Work of this Section.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
2. Install Work in according to SMACNA recommendations and as indicated.

B. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

1. Conceal fasteners where possible.
2. Install with exposed edges folded back to form hems.

C. Install exposed sheet metal flashing and trim true to lines and levels indicated. Provide neat seams with minimum exposure of solder, welds, and sealant.

D. Install sheet metal flashing and trim to result in watertight performance.

E. Expansion Provisions:

1. Space movement joints at maximum 10 feet with no joints allowed within 24 inches of corner or intersection.

2. Where lapped or bayonet type expansion provisions cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant concealed within joints.

F. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches, except where pretinned surface would show in finished Work.

1. Do not solder prepainted, metallic-coated steel sheet.
2. Stainless Steel Soldering: Pretin edges using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
3. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

G. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

1. Fill joint with sealant, minimum 1/4 inch diameter bead, and form metal to completely conceal sealant.
2. Use joint adhesive for nonmoving joints specified not to be soldered.

H. Seams: Fabricate nonmoving seams in sheet metal with specified seams. Tin edges to be seamed, form seams, and solder.

I. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates and protect against galvanic action painting contact surfaces with bituminous mastic coating or by other permanent separation as recommended by fabricator of dissimilar metals.

1. Coat uncoated aluminum, stainless steel, and lead flashing and trim in contact with wood, ferrous metal, or cementitious construction.
2. Underlayment: Install course of felt underlayment and cover with a slip sheet where metal flashing is installed directly on cementitious or wood substrates.

J. Install reglets to receive counterflashing where shown or indicated.

1. Where reglets are shown in masonry, furnish reglets for installation under Section 042113.

K. Counterflashings: Coordinate with installation of base flashing.

1. Lap-seam vertical joints a minimum of 4 inches and bed with sealant.
2. Miter, lap-seam, and close corner joints with solder.
3. Overlap base flashing 4 inches minimum.
4. Install bottom edge spring-tight against base flashing.
5. Provide where roof intersects vertical surfaces, and where indicated.

L. Cleats:

1. Space cleats not more than 12 inches apart.
2. Anchor cleats with 2 fasteners to prevent cleat rotation.
3. Bend tabs over fastener head.

M. Roof Vent Pipe Flashing:

1. Place correct size flashing over vent stack with angle facing down slope of roof.
2. Use corrosions resistant fasteners recommended by manufacturer.
3. Secure top of flashing to roof at each corner and at spacing recommended by manufacturer.
4. Lap bottom edge of flashing over roof shingles.

N. Flexible Membrane Flashing:

1. Install flexible membrane flashing at window and door openings and where shown or indicated to comply with AMAA 2400-02.
2. Prime substrates as recommended by flashing manufacturer.
3. Lap seams and junctures with other materials at least 4 inches, except that at flashing flanges of other construction, laps need not exceed flange width.
4. Lap flashing over weather resistive building paper at bottom and sides of openings.
5. Lap weather resistive building paper over flexible flashing at heads of openings.
6. After flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.
7. Install Preformed Corner Flashing at lower corners of window opening.
8. When temperature is less than 60 degrees F achieve desired adhesion with heat gun.

O. Mechanical and Electrical Device Wall Penetration Flashing:

1. Install only on exterior vertical wall sheathing.
2. Use only product designed for Division of Work device penetrating wall.
3. Integrate with weather resistant barrier sheeting in shingle fashion - place lower portion of flashing device on sheeting, upper portion under sheeting with opening cut for device being flashed.
4. Conform to manufacturer’s installation recommendations.

3.3 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.

1. Neutralize flux as work progresses with 5 percent to 10 percent washing soda solution, and thoroughly rinse.

C. Clean finished surfaces of completed installation. Maintain in a clean condition during construction.

D. Replace sheet metal flashing and trim damaged or that has deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes flexible, self-adhering sheet flashing including, but not limited to, the following applications:

1. For protection against water and air infiltration around windows and doors and around other openings in walls.

B. Related Sections:

1. Section 07 92 00: Joint Sealants

1.2 SUBMITTALS

A. Product Data including manufacturer's installations, and general recommendations for each specified flashing material.

B. Shop Drawings of each item showing methods of application at window, door, and other wall penetrations.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed work similar in material, design, and extent to that indicated for this Project.

1.4 COORDINATION

A Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation.

PART 2 PRODUCTS

2.1 FLEXIBLE SELF-ADHERING MEMBRANE FLASHING

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

1. W.R. Grace: Vycor V40 Weather Barrier Strips; self-adhered, self-sealing rubberized asphalt sheet.
2. W.R. Grace: Vycor Plus Membrane, 60 mil.

2.2 ACCESSORIES

A. Elastomeric Sealant: Silicone type specified in Section 07 92 00 by Dow Corning, GE, or approved.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which work of this Section will be installed.

1. Verify that substrates are ready to receive Work of this Section.
2. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install flexible, self-adhering sheet flashing in accordance with manufacturer's written installation instructions.

B. Install flexible, self-adhering sheet flashing at the following locations, and where indicated in the Drawings:

1. Perimeter of window openings.
2. Perimeter of door openings.
3. Wall penetrations.

C. Window Openings with Flanged Windows: Install at perimeter of window openings as follows, as detailed in the Drawings, unless otherwise recommended by manufacturer:

1. Verify that weather resistant barrier (air infiltration barrier) is wrapped to inside of opening. Cut barrier at head diagonally at corners and raise top edge and tape above opening.
2. Apply sheet flashing at sill extending beyond jambs with top edge of flashing level with top edge of the rough opening.
3. Apply continuous bead of sealant to back of window flanges and install window.
4. Apply sheet flashing across head

3.3 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

1. Neutralize excess flux as work progresses with 5 percent to 10 percent washing soda solution, and thoroughly rinse.

B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage at the time of Substantial Completion.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes elastomeric joint sealants for building applications shown or indicated, and as required to establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Related Sections:

1. Section 07 54 42: PVC Roofing, for requirements affecting work of this Section.
2. Section 07 60 00 Flashing and Sheet Metal

1.2 SUBMITTALS

A. Product Data for each joint sealant product indicated, including manufacturer's recommended installation procedures.

B. Samples: Manufacturer’s color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1. Upon request of Architect, submit physical samples of each sealant, backing material, primer, and bond breaker proposed for use.

C. Warranties: Copies of special installers and manufacturers warranties.

D. SWRI Validation: Evidence that each exterior elastomeric sealant has been validated by the Sealant Weatherproofing Restoration Institute’s (SWRI) Sealant Validation Program.

E. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Joint substrates and sealant backings have been tested for compatibility and adhesion with joint materials.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Field Test Report Log: For each exterior elastomeric sealant application.

1.3 QUALITY ASSURANCE

A. Applicator Qualifications: Use workers trained and experienced in necessary crafts and familiar with requirements and methods needed for proper performance of Work of this Section.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Quality Standard: Sealant, Waterproofing and Restoration Institute (SWRI) requirements for materials and installation.

D. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
3. For materials failing tests, obtain joint sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
4. Testing will not be required if joint sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates.

E. Provide products that have been tested according to SWRI's Sealant Validation Program for compliance with requirements specified within a 36 month period preceding commencement of the Work.

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Section 01 31 00.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to job site in their manufacturer's original containers, with labels intact and legible, and maintain intact until time of use.

B. Do not retain material that has exceeded shelf life recommended by manufacturer.

1.5 ENVIRONMENTAL CONDITIONS

A. Do not install sealant when joint substrates are wet, or ambient and substrate temperature conditions are outside limits recommended by manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS - GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. Colors: As selected from manufacturer's full range of standard colors.

1. In exposed installation, use color of approximate color of adjacent surfaces, unless otherwise approved.
2. In concealed installation use standard gray or black sealant.

2.2 SEALANT MATERIALS

A. Polyurethane and Silyl-Terminated Polyether (STP), Sealant - Class 25 (Medium Modulus):

1. Single-Component, non-sag, ASTM C 920, Type S, Grade NS, Use NT, Class 25, (Joint movement range 25 percent in extension and 25 percent in compression).
2. Product: Provide the following or approved.

a. Sonneborn; Sonolastic 150 VLM.

B. Latex Sealant:

1. Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
2. Products: One of the following, or approved.

a. BASF Sonneborn Sonolac.
b. Pecora AC-20+.
c. Tremflex 834.

C. Traffic-Grade Polyurethane Sealant – Class 25:

1. Single-Component, non-sag or pourable as applicable, neutral curing, ASTM C 920, Type S, Grade NS or P, Uses T and I, Class 25, (Joint movement range 25 percent in extension and 25 percent in compression).
2. Products: One of the following or approved.

a. BASF Sonneborn Sonolastic NP 1.
b. Pecora Urexpan NR-201.
c. Sika Sikaflex - 1a or Sikaflex - 1CSL.
d. Tremco Vulkem 116 or Vulkem 45.

2.3 BACKUP MATERIALS

A. Use only those backup materials that are non-absorbent, non-staining, and specifically recommended by manufacturer for installation with type of sealant used.

B. Sealant Backer Rod: Provide one of the following Type B backing rods (bicellular material with a surface skin) unless otherwise recommended by sealant manufacturer:

1. Nomaco Inc.: “Sof Rod.”
2. BASF Sonneborn: “Soft Backer Rod.”

C. Bond Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Use only those primers which have been tested for durability on surfaces to be sealed and are specifically recommended by sealant manufacturer for adhesion of joint sealant substrates, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to sealant and backing material manufacturer, formulated to promote optimum adhesion of sealant with joint substrates.

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

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine joints to receive joint sealants for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface clean joints immediately before installing sealant complying with manufacturer's instructions, and the following:

1. Remove all foreign material from joint substrates that could interfere with adhesion of sealant, including dust, oil, grease, rust, lacquer, laitance, loose mortar, ice and frost.

B. Concrete and Masonry:

1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, or mechanical abrading; remove loose particles from cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
2. Where surfaces have been treated, remove surface treatment by sandblasting or wire brushing.
3. Remove laitance and mortar from masonry joint cavities
4. Remove laitance and form-release agents from concrete.

C. Metal surfaces:

1. Scrape steel surfaces with metal or wire brush to remove mill scale and rust.
2. Clean nonporous surfaces with chemical cleaner which leaves no residue to remove oil and grease, and protective coatings, wiping surfaces with clean rags.

D. Prime joints substrates where recommended by sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience.

1. Apply primer to comply with joint sealant manufacturer's written instructions.
2. Confine primers to areas of joint sealant bond.

E. Use masking tape where required to prevent contact of sealant with adjoining surfaces that would otherwise be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears.

3.3 INSTALLATION

A. Install joint sealers in accordance with recommendations of ASTM C 1193, and manufacturer's recommended installation procedures, as applicable to materials, applications, and conditions indicated.

1. Do not paint silicone sealants.
2. Where painting of sealants is a concern, obtain approval of Architect prior to application as to where use of polyurethane sealants is allowed.

B. Sealant Backings:

1. Install material to uniform depth below sealant.
2. Using tool, smoothly and uniformly place backup material to depth of approximately 1/2 joint width (1/4 inch to 1/2 inch), compressing backup material 25 percent to 50 percent and securing a positive fit.
3. Do not leave gaps between ends of sealant backings.
4. Do not stretch, twist, puncture, or tear sealant backings.

C. Install bond breaker tape behind sealant where sealant backing is not used between sealant and back of joints.

D. Install sealant by proven techniques at the same time backings are installed.

1. Thoroughly fill joints to recommended depth with sealant in direct contact with joint substrates.
2. Produce uniform, cross sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
3. Prevent three-sided adhesion of sealant to substrates.

E. Tool joints to profile shown in Drawings, or as indicated below if such profiles are not shown in Drawings.

1. Provide uniformly smooth joints with slightly concave surface, flush at edges with adjacent surface, according to ASTM C 1193, unless otherwise indicated.
2. Do not use tooling agent unless specifically recommended in writing by sealant manufacturer.
3. Leave sealant surface neat and smooth.

F. Install preformed foam sealant according to manufacturer's instructions, taking care not to pull or stretch material.

3.4 FIELD QUALITY CONTROL

A. Field Adhesion Testing: Test completed joint-sealant adhesion to joint substrates as follows:

1. Test joint sealant after sealant has cured (usually within 7 to 21 days).
2. Perform 10 tests for the first 1000 feet of joint length for each type of sealant and joint substrate, and 1 test each 1000 feet of joint length thereafter.
3. Test Method: Test according to Method A, Field-Applied Sealant Joint Hand Pull Tab in ASTM C 1193, Appendix X1.
4. Record results in a field-adhesion test log. Include the following:

a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively.

1) Include data on pull distance used to test each type of product and joint substrate.
2) Compare results to determine if adhesion passes sealant manufacturer's field adhesion hand-pull test criteria.

b. Whether sealants filled joint cavities and are free of voids.
c. Whether sealant dimensions and configurations comply with specified requirements.

5. Include in test log, dates when sealants were installed, names of installers, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
6. Repair sealants pulled from test areas by applying new sealants following same procedures used to originally seal joints.

a. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field Test Reports:

1. Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory.
2. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements.
3. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean adjacent exposed surfaces free from sealant as installation progresses, using cleaning agent recommended by manufacturer of sealant used.

3.6 SEALANT SCHEDULE

A. Exterior Joints in Vertical Surfaces and Horizontal Nontraffic Surfaces:

1. Includes joints in concrete, masonry, fiber-cement siding, metals, and at perimeter of building exterior door and window frames, and at other openings and joints in exterior walls:

a. Polyurethane and Silyl-Terminated Polyether (STP), Sealant - Class 25 (Medium Modulus), unless otherwise recommended by sealant manufacturer for specific application and approved by Architect.
b. Color: As selected by Architect.

B. Interior Joints in Vertical Surfaces and Horizontal Nontraffic Surfaces:

1. At building interiors at door and window frames in exterior walls:

a. One of the Following Types:

1) Latex.
2) Polyurethane Sealant - Class 25 (Medium Modulus).

b. Color: As selected by Architect.

C. Exterior Horizontal Traffic Surfaces:

1. Silicone Traffic-Grade Sealant, Single-Component, Class 100/50.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes surface preparation and application of paints and coatings.

B. Related Sections:

1. Sections where factory preparation, priming, or priming and finishing, of painted or finished surfaces is specified.

1.2 WORK NOT INCLUDED

A. Unless otherwise indicated, painting is not required on surfaces in concealed areas and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe spaces, and duct shafts.

B. Metal surfaces of anodized or painted aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials shall not require painting under this Section, unless otherwise noted.

C. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts.

D. Do not paint required labels or equipment identification, performance rating, name, or nomenclature plates.

E. Do not paint gypsum board walls above suspended ceilings.

1.3 REFERENCES

A. The Master Painters Institute (MPI): Approved Product List, Latest Edition.

1.4 DEFINITIONS

A. "Paint", as included herein, means coating, systems materials including primers, emulsions, epoxy, stained enamels, sealers, fillers, and other applied materials whether used as primer, intermediate, or finish coats.

B. Gloss/Sheen Parameter (Reflectance based off 60 degree angle reading) based on MPI (Master Painters Institute):

1.	Gloss Level 1:	Maximum 5 units.	Flat matte finish
2.	Gloss Level 2:	Maximum 10 units	Flat, high side sheen; velvet-like finish
3.	Gloss Level 3:	10-25 units	Eggshell-like finish
4.	Gloss Level 4:	20-35 units	Satin-like finish
5.	Gloss Level 5:	35-70 units	Semi-gloss
6.	Gloss Level 6:	70-85 units	Gloss
7.	Gloss Level 7:	More than 85 units	High gloss

1.5 SUBMITTALS

A. Product Data:

1. Materials list of required coating materials. Identify each material by manufacturer's catalog number, general classification, and cross-reference with finish system and application.
2. Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

B. Samples:

1. Stepped Samples, defining each separate coat, of each color and material to be applied.

   a. Provide three Samples of each drawdown, approximately 8 x 10 inches in size, each marked with specified color designation.
   b. If requested by Architect, submit samples during construction representative samples of the actual substrate.

2. Revise and resubmit Samples as requested until required sheen, color, and texture is achieved. Approved Samples become standards of color and finish for accepting or rejecting Work of this Section.
3. Do not commence painting until approved Samples are on file at job site.

C. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

1.6 QUALITY ASSURANCE

A. Use skilled workers who are trained and experienced in crafts and familiar with requirements and methods needed for proper performance of Work of this Section.

B. Provide Work in conformance with recommendations in the "Architectural Painting Specification Manual" by The Master Painters Institute (MPI).

C. Mock-up: Provide a full-coat benchmark finish sample of each type of coating and substrate required on the Project, where directed by Architect, and where permanent lighting has been activated.

1. Walls and Ceilings: Provide samples on a minimum of 100 sq. ft.
2. Doors and Frames: One door and frame at exterior steel and interior locations.
3. Approved mock-ups will be used as standard for Work of this Section.
4. Approved mock-ups may be used as part of the finished Work.

1.7 REGULATORY REQUIREMENTS

A. Provide products that comply with local regulations controlling use of volatile organic compounds (VOCs).

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver in manufacturer's original, unopened containers with legible labels intact.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum temperature of 45 degrees F.

1.9 PROJECT CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 degrees F.

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 and 95 degrees F.

C. Use low temperature paint products equal to specified products, as approved, for applications when air temperatures are below 50 degrees F.

D. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or to damp or wet surfaces.

1. Applications may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the paint manufacturer as being suitable during application and drying periods.

1.10 EXTRA MATERIALS

A. Furnish and deliver to the Owner extra paint materials from the same production run as the materials applied equaling 5 percent, but not less than one gallon or more than 5 gallons, of each material, color, and gloss applied.

1. Package paint materials in unopened, factory-sealed containers for storage, clearly labeled describing contents and location where used.

PART 2 PRODUCTS

2.1 ACCEPTABLE PRODUCTS

A. Subject to compliance with requirements, provide products listed in the Paint Schedule at the end of Part 3.

B. Other products listed in the MPI (Master Painters Institute) Approved Product List, latest edition, are acceptable, subject to compliance with requirements and approval. Submit according to requirements of Section 01 2500; include paint manufacturers statement that proposed substitution is equal or superior to product listed.

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide fillers, primers, undercoats, and finish coat materials that are compatible with one another and the substrates indicated under service and application, as demonstrated by manufacturer based on testing and field experience.

B. Undercoats and Thinners:

1. Provide undercoat paint produced by same manufacturer as finish coat.
2. Use only thinners recommended by paint manufacturer and use only to recommended limits.
3. Insofar as practicable, use undercoat, finish coat, and thinner material as parts of a unified system of paint finish, except where material is factory primed.

4. Where accent colors are scheduled or indicated, provide appropriate and sufficient undercoats accordingly.

C. Colors: Match colors indicated by reference to manufacturer's color designations.

2.3 APPLICATION EQUIPMENT

A. For application of paint materials, use only such equipment as is recommended for application of particular paint by manufacturer of that paint, and as approved by Architect.

B. Prior to use of application equipment, verify proposed equipment is compatible with material to be applied, and integrity of finish will not be jeopardized by use of proposed equipment.

2.4 OTHER MATERIALS

A. Provide other materials required for a complete and proper installation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.

1. Do not proceed with application of paint until unsatisfactory conditions have been corrected and surfaces are receiving paint are thoroughly dry.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates.

1. Provide barrier coats over non-compatible primers or remove primer and re-prime as required to achieve compatibility with finish coatings.
2. Notify the Architect in writing of anticipated problems using materials specified over substrates primed by others.

3.2 PREPARATION

A. General:

1. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to painted. If removal is impractical or impossible, provide surface-applied protection prior to surface preparation and painting.
2. After completion of painting operations in each space or area, reinstall removed items by using workers who are skilled in trades involved.

B. Cleaning and Preparation:

1. Clean and prepare surfaces to be painted in strict accordance with paint manufacturer's recommendations for each substrate condition, and as specified.
2. Remove oil and grease with clean cloths and cleaning solvent of low toxicity and flash point in excess of 200 degrees F, prior to start of mechanical cleaning.
3. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall onto wet painted surfaces.

C. Preparation of Cementitious Surfaces:

1. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. Use mechanical methods for surface preparation if hardeners or sealers have been used.
2. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
3. Determine alkalinity and moisture content of surfaces by performing appropriate tests. Correct alkaline conditions, and do not paint surfaces where moisture content exceeds that permitted by paint manufacturer.
4. Clean concrete floors with a 5 percent solution of an etching cleaner. Flush floor with clean water to remove cleaner, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.

D. Preparation of Wood Surfaces:

1. Clean surfaces until free from dirt, oil, and other foreign substances.
2. Smooth finished surfaces exposed to view with sandpaper.
3. Do not proceed with painting of wood surfaces until the moisture content of the wood is 12 percent or less as measured by a moisture meter.

E. Preparation of Metal Surfaces:

1. Ungalvanized, Uncoated Surfaces: Clean surfaces until free from dirt, oil, and grease, and loose mill scale.

    a. Blast steel surfaces clean as recommended by paint system manufacturer and according to requirements of Steel Structures Painting Council (SSPC) SP 10.
    b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

2. Ungalvanized, Coated Surfaces: Clean surfaces until free from dirt, oil, and grease, and touch up bare areas and shop applied prime coats that have been damaged. Touch up with the same primer as the shop coat.
3. Galvanized surfaces: Remove oil and surface contaminants with nonpetroleum-based solvents. Use mechanical methods to remove pretreatment from galvanized sheet metal fabricated from coil stock.

F. Materials Preparation:

1. Mix and prepare paint materials in accordance with manufacturers' instructions.
2. When materials are not in use, store in tightly covered containers.
3. Maintain containers used in storage, mixing, and application of paint in a clean condition, free from foreign materials and residue.
4. Stir materials before application, producing a mixture of uniform density.

    a. Do not stir surface film into material; remove surface film and, if necessary, strain material before using.

3.3 APPLICATION

A. General:

1. Apply paint materials in accordance with manufacturers and referenced standard's recommended installation procedures.

2. Tint undercoats to match the color of the finish coat but provide a lighter shade in each undercoat to distinguish each separate coat.
3. Sand and dust between coats to remove defects visible to unaided eye from a distance of five feet.
4. On removable panels and hinged panels, paint backsides to match exposed faces.
5. Sand lightly between each succeeding enamel or varnish coat.
6. Omit primer on metal surfaces that have been shop primed and touch up painted.
7. Apply additional coats where undercoats, stains, or other conditions show through the final coat of paint, until paint finish is uniform in color, appearance, and opacity.

B. Drying:

1. Allow sufficient drying time between coats, modifying period as recommended by material manufacturer to suit weather conditions.
2. Consider oil-base and oleo-resinous solvent-type paint as dry for recoating when paint feels firm, does not deform or feel sticky under moderate pressure of thumb, and when application of another coat of paint does not cause lifting or loss of adhesion of undercoat.

C. Brush Applications:

1. Brush out and work brush coats onto surface in an even film.
2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, and other surface imperfections to be repaired.

D. Spray Application:

1. Where spray application is used, apply each coat to provide hiding equivalent of brush coats.
2. Do not double back with spray equipment to build up film thickness of two coats in one pass.

E. For completed Work, match approved Samples as to texture, color, sheen.

1. Remove, refinish, or repaint work not in compliance with specified requirements.

F. Minimum Coating Thickness: Provide the total dry film thickness of the entire system specified, but in no case less than recommended by the manufacturer.

G. Miscellaneous surfaces and procedures:

1. Exposed Mechanical Items:

a. Finish electric panels, access doors, conduits, plug mold, pipes, ducts, grilles, registers, vents, and items of similar nature to match the adjacent wall and ceiling surfaces in finished spaces.
b. Paint visible duct surfaces behind vents, registers, and grilles flat black.
c. Wash galvanized metal with solvent, prime, and apply 2 coats of specified enamel.

2. Hardware:

a. Paint prime coated hardware to match adjacent surfaces.
b. Paint metal portions of head seals, jamb seals, and astragal seals to match color of door frame, unless otherwise directed by Architect.

3. Wet Areas (Toilet Rooms, Showers, Kitchens, Janitors, and the Like):

   a. Add an approved fungicide to paint.
   b. For oil base paints, use 1 percent phenylmercuric or 4 percent tetrachlorophenol.
   c. For water emulsion and glue size-sized surfaces, use 4 percent sodium tetrachloropenate.

4. Exposed Vents: Apply two coats of heat-resistant paint.
5. Plywood at Walls for Mounting Electric, Telephone and Data Equipment: Paint gray or blue as directed by Owner.

3.4 FIELD QUALITY CONTROL

A. The Owner reserves the right to engage an independent testing agency to sample the paint material being applied, and test for minimum coating thickness.

B. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.

C. The Owner may direct the Contractor to stop painting if test results show material being used does not comply with specification requirements.

1. The Contractor shall pay for testing, and repaint surfaces found to be coated with noncomplying paints. If the noncomplying paints are incompatible with specified paints, the Contractor may be required to remove noncomplying paint from painted surfaces.

3.5 CLEANING

A. Remove from the site each day, empty cans, rags, rubbish, and other discarded refuse created by Work of this Section, and dispose of in a legal manner.

1. Do not dump waste materials, including thinners, on site.
2. Do not use sanitary or storm drains.

3.6 PROTECTION

A. Protect Work of other trades against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide “Wet Paint” signs at newly painted finishes.

C. Touch up and restore damaged or defaced painted surfaces caused by other trades.

3.7 EXTERIOR PAINT SCHEDULE

A. Provide minimum dry mil thickness of 3 mils, but in no case less than recommended by paint manufacturer, or as otherwise noted.

B. Provide gloss/sheen indicated in this schedule unless otherwise indicated in Color Schedule.

C. Use low temperature paint products equal to specified products, as approved, for applications when air temperatures are below 50 degrees F.

D. Paint products followed with an * are acceptable products not MPI listed. Additional acceptable manufacturers are Valspar and Pratt & Lambert.

E. Primer: Wood - Opaque Finish:

1. First Coat: Exterior Latex Wood Primer MPI #6

Benjamin Moore: Fresh Start All-Purpose 100% Acrylic Primer 023-00.
ICI Dulux: Dulux Professional Exterior 100% Acrylic Primer 2000-1200.
Kelly-Moore: Stain Lock 11 Stain Resistant Acrylic Primer 255-100.
Miller Paint Co: Acri-Lite Primer 7052.
PPG: Seal Grip Interior/Exterior Latex Stain Blocking Primer 17-921.
Rodda Paint Co: First Coat Exterior Interior Latex Primer 50 1601 1.
Sherwin Williams: A-100 Exterior Latex Wood Primer B42W41.

F. Primer: Ferrous Metal:

1. First Coat: Rust Inhibitive Primer (Water Based) MPI #107.

Benjamin Moore: Acrylic Metal Primer M04.
ICI Dulux: Devflex DTM Flat Interior/Exterior W.B. Primer 4020.
Kelly-Moore: DTM Acrylic Metal Primer 5725.
Miller Paint Co: Acrimetal Primer – Finish White 5000.
PPG: Pitt-Tech Rust Inhibitive Primer (W.B.) 90-712.
Rodda Paint Co: Professional Maintenance Metal Master Primer 508901x.
Sherwin Williams: Industrial & Marine DTM Acrylic Prime/Finish B66W1.

G. Primer and Pretreatment: Galvanized Metal:

1. Pretreatment (Metal Conditioner): Clean and acid etch.

Keeler and Long 6235.
Oakite 33.
Porter Prep 99.
ZRC Metal Conditioner.

2. First Coat: Galvanized Primer (Water Based) MPI #134.

Benjamin Moore: Alkyd Metal Primer M04*.
ICI Dulux: Devoe Coatings Devflex WB DTM Primer Finish 4020.
Kelly-Moore: Kel Guard Galvanized Iron Primer 1722.
Miller Paint Co: Acrimetal Primer-Finish White 5000.
PPG: Pitt-Tech DTM High Performance Primer/Finish 90-712*.
Rodda Paint Co: Professional Maintenance Metal Master Primer 508901x*.
Sherwin Williams: Industrial & Marine DTM Acrylic Primer/Finish B66W1.

H. Primer: Aluminum – Mill Finish:

1. First Coat: Vinyl Wash Primer MPI #80.

Miller Paint Co: Vinyl Wash Coat Primer 9172.
PPG: Polyclutch Vinyl Wash Primer 97-687/688.
Rodda Paint Co: Professional Maintenance Vinyl Wash Coat 709700X.
Sherwin Williams: DTM Wash Primer B71Y1*.

I. Finish Coats: Wood with Opaque Finish:

1. Second and Third Coats: Exterior Latex Low Sheen MPI #15

Benjamin Moore: Moorcraft Super Spec 100% Acrylic Exterior Satin 184.
Miller Paint Co: Acri-Lite Satin 7400*.
PPG: Sun-Proof Exterior House and Trim Satin Latex 76-45.
Rodda Paint: Unique II Low Gloss Exterior/Interior Latex Enamel 53 2001 1.
Sherwin Williams: A-100 Exterior Latex Satin A82W510.

2. MPI Gloss Level 3-4: Gloss minimum 10 and maximum 35 units at 60 degrees.

J. Finish Coats: Ferrous and Galvanized Metals:

1. Second and Third Coats: Exterior Latex Semi-Gloss MPI #11

Benjamin Moore: MoorGlo Acrylic Latex House & Trim Paint 096*.
ICI Dulux: Delux Exterior Acrylic Semi-Gloss 2407-0110.
Kelly-Moore: Acry-Lustre Exterior Semi-Gloss Acrylic Finish 1250-121.
Miller Paint Co: Acri-Lite Semi-Gloss 7500*.
PPG: S/G Latex House Paint 78-45.
Rodda Paint Co: Unique II Semi-Gloss Exterior Latex Enamel 54 2001 1.
Sherwin Williams: A-100 Exterior Gloss Latex A8W16.

2. MPI Gloss Level 5: Semi-Gloss; gloss of 35-70 units at 60 degrees.

K. System for Wood – Stained Solid Color Finish (S-1):

1. First and Second Coats: Exterior Solid Color Latex Wood Stain MP#16.

Benjamin Moore: Moorwood Latex Solid Siding Stain N089 01.
ICI Dulux: Woodpride Exterior Solid Stain 2600-0200.
Kelly-Moore: Acry-Shield Exterior Flat Acrylic Finish 1240.
Miller Paint Co: Acrylic Stain Blending Reducer 5901 combined with Kril Coat 5900 as directed by manufacturer*.
PPG: REZ Exterior Solid-Color Latex Stain 77-1110.
Rodda: Terra Latex Exterior Latex Flat Finish 33519.
Sherwin Williams: ProMar Exterior Solid Color Acrylic Stain A16W251.

2. MPI Gloss Level: Maximum gloss of 10 units at 60 degrees.

L. System for Brick and Stone - Transparent Finish:

1. Water repellent coating specified in Section 07 1900.

3.8 INTERIOR PAINT SCHEDULE

A. Provide minimum dry mil thickness of 3 mils, but in no case less than recommended by paint Manufacturer, or as otherwise noted.

B. Provide gloss/sheen indicated in this schedule unless otherwise shown in Color Schedule.

C. Paint products followed with an * are acceptable products not MPI listed.
Additional acceptable manufacturers are Valspar and Pratt & Lambert.

D. Primer: Wood - Opaque Finish:

1. First coat: Acrylic Primer Sealer MPI #39.

Benjamin Moore: Fresh Start Interior/Exterior Primer 23.
ICI Dulux: Prep-N-Prime Gripper Stain Killer Primer 3210-1200.
Kelly-Moore: Uni-Prime 295.
Miller Paint Co: PPG Seal-Grip Interior/Exterior Stain Blocking Primer 17-21.
Rodda Paint Co: Lasyn Enamel Undercoat 503001.
Sherwin Williams: PrepRite ProBlock Interior/Exterior Primer/Sealer B51W20.

E. Primer: Concrete Block:

1. First Coat: Interior/Exterior Latex Block Filler MPI #4

Benjamin Moore: Moorspec Int./Ext. Latex Block Filler 59501.
ICI Dulux: Devoe Coatings Bloxfil Acrylic Block Filler 4000-1000.
Kelly-Moore: Fill and Prime Acrylic Block Filler 521.
Miller Paint Co: Exterior Block Filler 6015.
PPG: Speedhide Interior/Exterior Latex Block Filler 6-15.
Rodda Paint Co: Interior/Exterior Latex Block Filler 33517.
Sherwin Williams: PrepRite Interior/Exterior Block Filler B25W25.

F. Primer: Gypsum Board and Concrete:

1. First coat: Interior Latex Primer Sealer MPI #50.

Benjamin Moore: Moorcraft Latex Undercoater & Primer Sealer 253-00.
ICI Dulux: Prep-N-Prime Interior Latex Wall Primer 1000-1200.
Kelly-Moore: Acry-Prime Interior Latex Primer/Sealer 971.
Miller Paint Co: Kril Primer Sealer 6040.
PPG: Speedhide Interior Latex Primer Sealer 6-2.
Rodda Paint Co: Scotseal Heavy Bodied Latex Sealer 50 7801 1.
Sherwin Williams: PrepRite Interior Latex Primer B28W200.

G. Primer: Ferrous Metal: Same as specified for exterior applications.

H. Primer and Pretreatment: Galvanized Metal: Same as specified for exterior applications.

I. Primer: Aluminum – Mill Finish: Same as specified for exterior applications.

J. Finish Coats: Gypsum Board – Dry Areas: (Acrylic)

1. Second and Third Coats: Interior Latex Eggshell MPI #52

Benjamin Moore: Architectural Coatings Regal Aquavelvet 319-01.
ICI Dulux: Dulux Professional Interior Latex Eggshell 1402 Series*.
Kelly-Moore: KM Professional Interior Acrylic Eggshell Enamel 1010.
Miller Paint Co: Satin Interior Latex 6200.
PPG: Satin Latex Interior Acrylic 6-3511.
Rodda Paint Co: Interior Eggshell Finish 333644.
Sherwin Williams: MPI 52 Gloss level 3 Interior Latex Eg-Shel B20W8521.

2. MPI Gloss Level 3: ‘Eggshell-like’ finish; gloss of 10-25 units at 60 degrees.

K. Finish Coats: Wood with Opaque Finish, Concrete, Concrete Block, Ferrous and Galvanized Metal, Gypsum Board – Wet Areas: (Acrylic)

1. Second and Third Coats: Interior Latex Semi-Gloss MPI #54

Benjamin Moore: Moorcraft Super Spec Latex Semi-Gloss Enamel 276-01.
ICI Dulux: Dulux Professional S.G. Wall and Trim Enamel 1406.
Kelly-Moore: KM Professional Interior Acrylic Semi-Gloss Enamel 1050.
Miller Paint Co: Pro-Jex Semi-Gloss Latex 1680*.
PPG: Speedhide Interior Semi-Gloss Latex 6-500.
Rodda Paint Co: Master Painter Interior Latex Semi-Gloss 54 3101 1.
Sherwin Williams: ProMar 200 Interior Latex Gloss B21W251.

2. MPI Gloss Level 5: Semi-Gloss; gloss of 35-70 units at 60 degrees.

3.9 PAINT AND COLOR SCHEDULE

A. Provide gloss/sheen indicated in this schedule meeting parameters of gloss/sheen indicated in Paragraph 1.4B, of products, or equivalent products, specified in Paint Schedules above.

B. Match colors indicated in Finish Legend in the Drawings.

END OF SECTION