

# SPECIFICATIONS

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## PARKWAY VILLAGE APARTMENTS – EAST & WEST

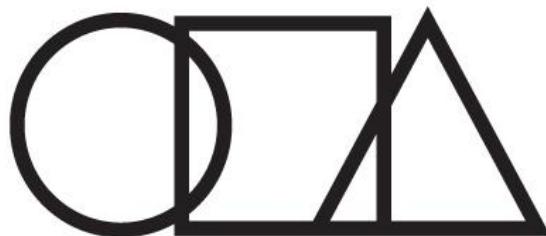
Salem, Oregon



**01.21.14**

Permit Review / Bid Set

CHA Jobs # 21348 (East) & 21345 (West)



CARLETON HART ARCHITECTURE

322 nw 8th avenue portland, oregon 97209  
t 503 243 2252 | f 503 243 3261 | carletonhart.com

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## SECTION 00 01 16 - PROJECT DIRECTORY

**OWNER**

Salem Housing Authority  
360 Church Street, SE  
Salem, Oregon 97308-0808  
Contact: Andy Wilch  
Ph: 503-588-6448

**ARCHITECT**

Carleton Hart Architecture  
322 NW 8<sup>th</sup> Avenue  
Portland, Oregon 97209  
Contact: Devin Follingstad  
Ph: 503-206-3185

**DEVELOPMENT CONSULTANT**

Housing Development Center  
847 NE 19<sup>th</sup> Avenue, Suite 150  
Portland, Oregon 97232  
Contact: France Fitzpatrick  
Ph: 503-335-0475

**GENERAL CONTRACTOR**

LMC Construction  
8324 SW Nimbus Avenue  
Beaverton, Oregon 97008  
Contact: Ryan Duffin  
Ph: 503-646-0521

**LANDSCAPE ARCHITECT**

Walker Macy Landscape Architecture  
111 SW Oak Street, Suite 200  
Portland, Oregon 97204  
Contact: Gary Datka  
Ph: 503-228-3122

**STRUCTURAL ENGINEER**

T M Rippey  
7650 SW Beveland Street, Suite 100  
Tigard, Oregon 97223  
Contact: Doug Gannett  
Ph 503-443-3900

**CIVIL ENGINEER**

MGH Associates  
104 West 9<sup>th</sup> Street, Suite 207  
Vancouver, Washington 98660  
Contact: Bill Brannan  
Ph 360-750-0399

**MECHANICAL / PLUMBING**

ENGINEER – Design Assist  
MKE & Associates  
6915 SW Macadam Avenue, Suite 200  
Portland, Oregon 97219  
Contact: Richard Dusa  
Ph 503-280-892-1188

END OF SECTION 00 01 16

**SECTION 00 31 00 – AVAILABLE PROJECT INFORMATION****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section includes information that is made available to the Contractor and is not part of the Contract Documents. Any information made available is for Contractors' convenience and are intended to supplement rather than serve in lieu of Contractors' own investigations. Information supplied are not warranty or guarantee, either expressed or implied, of existing conditions.

**1.2 AVAILABILITY**

- A. Referenced Available Project Information is bound under separate cover, unless indicated otherwise, and is available for viewing at the office of Owner.
- B. Additional available project information may be released without notice by the Owner or Architect.

**1.3 AVAILABLE PROJECT INFORMATION****A. Survey Information**

- 1. Site Survey Information – Bound in Drawings.
- 2. Prepared by: Multi/Tech Engineering Services, Inc.
- 3. Date: June 2010.

**B. Existing Hazardous Material Information**

- 1. Parkway Village Apartments, West, Rot Inspection Report.
- 2. Prepared by: MC3 Consultants, Inc. for Hahn and Associates, Inc.
- 3. Date: January 2, 2014.

**C. Geotechnical Data**

- 1. Geotechnical Investigation, Parkway Village Apartments – West Complex.
- 2. Prepared by: Carlson Geotechnical.
- 3. Date: January 03, 2014.

**PART 2 - PRODUCTS (NOT USED)****PART 3 - EXECUTION (NOT USED)****END OF SECTION 00 31 00**

**SECTION 00 50 00 – CONTRACTING FORMS AND SUPPLEMENTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes typical contracting forms and attachments signed by the Owner and Contractor, which is to be the legal instrument binding the two parties to the Work. Contracting forms that may be used and are available upon request and furnished at cost, include but may not be limited to the following:

1. AIA Document G702 / G703 – Application and Certificate for Payment and Continuation Sheet.
2. AIA Document G701 – Change Order.
3. AIA Document G706 – Contractor's Affidavit of Payment of Debts and Claims.
4. AIA Document G706A – Contractor's Affidavit of Release of Liens.
5. AIA Document G707 – Consent of Surety Company to Final Payment.
6. AIA Document G705 – Certificate of Insurance.
7. AIA Document A312 – Performance Bond and Payment Bond.
8. Contractor's Affidavit for Partial Payment.
9. Subcontractor's Partial Waiver and Release of Lien.
10. Subcontractor's Final Waiver and Release of Lien.
11. Contractor Affidavit for Final Payment.

- B. Related Sections include the following:

1. Division 01, Section "Summary" for general Project information.
2. Division 01, Section "Allowances" for administrative and procedural requirements governing Project related allowances.
3. Division 01, Section "Alternates" for administrative and procedural requirements governing Project related alternates.
4. Division 01, Section "Substitution Procedures" for administrative and procedural requirements governing product substitutions.
5. Division 01, Section "Payment Procedures" for administrative and procedural requirements necessary to prepare and process Applications for Payment.
6. Division 01, Section "Project Management and Coordination" for administrative provisions for identification of proposed subcontractors.
7. Division 01, Section "Construction Progress Documentation" for administrative and procedural requirements for the contractor's construction schedule.
8. Division 01, Section "Submittal Procedures" for administrative and procedural requirements for processing of submittals prior to and during construction.
9. Division 02 through 33 Sections for criteria required for pre-installation meetings.

**1.3 PRECONSTRUCTION SUBMITTALS**

- A. Commencement of the Work. Upon written notification of the date of commencement of the Work as agreed by Owner and Contractor, the Contractor shall deliver the following preconstruction Submittals to the Owner and Architect.
- B. The preconstruction submittals shall be delivered as indicated in the Contract Documents, the Agreement, or General or Supplementary Conditions, but no later than seven (7) days after written notification of the commencement of the Work.
- C. The preconstruction submittals shall be bound in a separate manual and one (1) copy shall be maintained at Project site and made available to Owner and Architect.
- D. Submittals.
  - 1. Copies of the following contracting forms and Agreements between Owner and Contractor:
    - a. Fully executed Agreement between Owner and Contractor.
    - b. General Conditions of the Contract.
    - c. Supplementary Conditions of the Contract (if used).
    - d. Performance and Payment Bond.
    - e. Certificate of Insurance.
    - f. Wage Determination Schedule.
  - 2. Allowances.
  - 3. Alternates.
  - 4. Substitutions accepted during Bidding.
  - 5. Schedule of Values.
  - 6. Contractor's construction schedule.
  - 7. Contractor's submittal schedule.
  - 8. List of subcontractors and major suppliers.
  - 9. Contractor's Quality Control Plan.
  - 10. Contractor's pre-installation meeting schedule.

**PART 2 - PRODUCTS (NOT USED)****PART 3 - EXECUTION (NOT USED)****END OF SECTION 00 50 00**

**SECTION 00 07 00 – BIDDING AND CONDITIONS OF THE CONTRACT****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and other Division 1 Specification Sections, apply to this Section.

**1.2 GENERAL**

- A. The following documents are Conditions of the Contract and are part of this specification. The Contractor and all Subcontractors shall read and be governed by them.

**B. Documents:**

1. Salem Housing Authority Bidding Requirements
2. Contract Provisions Required by Federal Law or Owner Contract with the U.S. Department of Housing and Urban Development.
3. Davis-Bacon Act Commercial Wage Determination for Marion County, Oregon.
  - a. The enclosed edition of wage rates (General Decision Number: OR140028) was current as of the date of this printing; Effective as of 01/17/2014. The latest edition of the Davis-Bacon portion, as of 10 days before the bid date, will be the edition required for this bid. The latest version can be obtained from the Federal website <http://www.wdol.gov/Index.aspx>.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION (Not Used)****END OF SECTION 00 70 00**

# Salem Housing Authority Bidding Requirements

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Information for Bidders  
Substitution Requests Form  
First Tier Disclosure and Instruction Form  
Value Engineering Change Proposal (includes Life Cycle and Instruction for use).  
Contract  
Performance and Payment Bonds  
Insurance Requirements  
City of Salem Equal Opportunity Policy for Contractors

### **SUBMITTAL REQUIREMENTS**

HUD Bid Bond  
HUD Bid Form  
Contractor/Subcontractor Section 3 Certification and Agreement

### **FEDERAL REQUIREMENTS**

Noncollusive Affidavit  
Certification for Contracts, Grants, Loans, and Cooperative Agreements  
Form CC257 (Monthly Employment Utilization Reports)  
Instructions for Filing Employer Information Report - EEO-1  
Equal Employment Opportunity Employer Information Report - EEO-1  
Executive Order 11246  
Contractor/Subcontractor Agreement  
Contractor's Section 3 Opportunities Plan and Instructions  
Construction Contractors Affirmative Action Requirements - Part 60-4  
Federal Register/Rules and Regulations, Title 24 - Part 135  
Federal Register - Solicitation Provisions and Use of Contract Clauses  
Federal Labor Standards Provisions (HUD 4010)  
General Conditions for Construction Contracts (HUD-5370)

Debarment/Suspension Certification  
Federal Wage Decisions

### **CITY OF SALEM**

Specifications  
Drawings/Maps

## INFORMATION FOR BIDDERS

### **1. General Description of Project**

A general description of the work to be performed is contained in the "Invitation to Bidders." The scope is indicated in applicable parts of these contract documents. The Contractor shall furnish all materials, unless otherwise specified. Where plans are included with the contract documents they are to be considered a part of the contract documents and the scope may be indicated on the plans as specified.

### **2. Contract Documents**

The Contract Documents under which it is proposed to execute the work consist of the material bound herewith, together with any materials referred to by reference herein, **including the City of Salem "Standard Construction Specifications,"** and any accompanying Plans. These Contract Documents are intended to be mutually complementary and to provide all details reasonably required for the execution of the proposed work. Any person contemplating the submission of a proposal and being in doubt as to the meaning or intent of said Contract Documents shall at once notify, in writing, the City Contracts and Procurement Administrator of the City of Salem. Any interpretation or change in said Contract Documents shall be made only in writing, and a copy of such interpretation or change will be mailed or delivered to each person receiving a set of Documents. The SHA will not be responsible for any other explanation or interpretation of said Documents.

### **3. Form of Proposal**

All proposals must be submitted on the form furnished. Unit price proposals will be accepted on all items of work set forth in the Proposal, except those designated to be paid for as a lump sum. The estimate of quantities of work to be done is tabulated in the Proposal and, although stated with as much accuracy as possible, is approximate only and is assumed solely for the basis of calculation upon which the award of the Contract shall be made. Payment to the Contractor will be made on the measurement of the work actually performed by the Contractor as specified in the Contract Documents. SHA reserves the right to increase or diminish the amount of any class of work as may be deemed necessary.

The contractor will be allowed no claims for anticipated profits, loss of profits or for any damages of any sort because of any difference between the estimated and the actual quantities of work done, except as specifically noted in these contract documents.

### **4. Preparation of Proposals**

It is mandatory that all unit price blank spaces and lump sum blank spaces being bid shall be filled in with legible figures. Figures must be in ink and bidders are encouraged to use mechanical devices for printing their bid figures. Further, bidders are encouraged, but not required, to write, in the appropriate blank spaces, their unit prices and lump sum prices in words. **If the bidder's figures are not legible and the bidder fails to provide bid amounts in words, the bid will be considered NON-RESPONSIVE and shall not be considered for contract award. Bid amounts in words shall prevail in cases of discrepancy between the amounts stated in words and the amounts stated in figures.**

Any proposal shall be deemed irregular which contain omissions, alterations, or additions of any kind, or prices uncalled for, or in which any of the prices are obviously unbalanced, or which in any manner shall fail to conform to the conditions of the published "Invitation to Bidders."

Erasures or interlineation in the proposal must be explained or noted over the signature of the bidder.

The Bidder shall sign his Proposal in the blank space provided therefor. Proposals made by corporations or partnerships shall contain names and addresses of the principal officers or partners herein. If the Proposal is made by a corporation, it must be signed by one of the principal officers thereof. If made by a partnership, it must be signed by one of the partners, clearly indicating that he is signing as a partner of the firm. In the case of a Proposal made by a joint venture, each of the joint ventures must sign the Proposal in his personal capacity.

**5. Submission of Proposals**

All proposals must be submitted in the time and place and in the manner prescribed in the "Invitation to Bidders." Proposals must be made on the prescribed proposal forms furnished the bidder. Each proposal must be submitted in a sealed envelope, so marked as to indicate its contents without being opened.

**6. Modification or Withdrawal of Proposal**

Any bidder may modify his bid by written or electronic communication at any time prior to the scheduled closing time for receipt of bids, provided such communication is received by the City prior to the closing time, and provided further that a written confirmation of the electronic modification over the signature of the bidder was mailed prior to closing time. If written confirmation of a electronic communication is not received within at least two days of the closing time, no consideration will be given to the modification. The written or electronic communication should not reveal the bid price but should state the addition or subtraction or other modification so that the final prices or terms will not be known by City until the sealed bid is opened.

Proposals may be withdrawn prior to the scheduled time for closing of the proposals either by electronic or written request, or in person.

**7. Conditions of Work**

Each bidder must inform himself of the conditions relating to the execution of the work, and it is assumed that he will inspect the site and make himself thoroughly familiar with all the contract documents. Failure to do so will not relieve the successful Bidder of his obligations to enter into a contract and complete the contemplated work in strict accordance with the contract documents.

**8. Award of Contract**

A single contract shall be awarded to the bidder that is the lowest responsible bidder on **TOTAL BASE BID PLUS ALTERNATES**. SHA reserves the right to accept or reject any or all proposals, and to waive any informalities and irregularities in said proposals.

**9. Failure to Execute Contract.**

The Contracts and Procurement Division will notify the successful bidder that the contract documents are ready for execution. Upon failure by the successful bidder to enter into the contract and furnish the necessary insurance and/or bond requirements within 10 days from that date of notification, the bid security accompanying the bid shall be forfeited, the proceeds paid to

SHA, and the award withdrawn. The award may then be made to the next lowest responsible bidder, or all bids rejected and work re-advertised.

10. **Disclaimer of Responsibility.**

Memoranda, reports, and other information available to SHA regarding anticipated soil, subsoil, topographical and other physical conditions which might be encountered on the site will be made available to prospective bidders. Data contained in such reports or information is for general information of bidders only, and SHA will not be responsible for the actual physical conditions which the Contractor may encounter.

Sole and exclusive responsibility for interpretation of such information is on the bidder, and such reports, logs, memoranda and other information shall not be construed as a complete statement of the existing conditions nor as a warranty, expressed or implied, as to conditions which may actually be encountered in prosecution of the work.

SHA will not be responsible for oral interpretations. Should a bidder find discrepancies in or omissions from, the Drawings, Specifications, or other bid documents, or be in doubt as to their meaning, he shall notify SHA at least ten (10) SHA working days prior to the bid closing date. Any and all such interpretations or approval of manufacturer's materials to be substituted will be made only in the form of written addenda to the Specifications which, if issued, will be hand-delivered or mailed by certified mail with return receipt requested to all prospective bidders receiving a set of such documents, not later than five (5) SHA working days prior to the date fixed for the closing of bids. All addenda so issued are to be covered in the bid for such Addenda to become part of the contract documents.

11. **Prebid Inquiries**

Bidders with pre-bid inquiries should contact the designated contact person at the designated telephone number indicated in the "Invitation to Bidders."

12. **Permits and Licenses**

Unless otherwise stated, the Contractor shall obtain and pay for all construction permits and licenses. The Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work that are applicable at the time of opening of Bids, or, if there are no Bids, on the effective date of the Contract. SHA shall pay all charges of utility owners for connections for providing permanent service to the Work.

13. **Federal or State Funding**

If Federal or State funds are involved in the project, there may be certain forms or certifications required by the Federal or State agency responsible for administration of those funds. Failure of the Bidder to properly complete and submit a required form may result in disapproval of the bid by the agency involved, in which case the bid will be rejected by SHA.

14. **Minimum Requirement of Bid**

The following minimum requirements as to the form and manner of submitting bids must be strictly observed; variances from these requirements will result in rejection of the bid as unresponsive.

- a. Bids must be submitted on forms furnished by the City.

- b. Bids must be signed by the Bidder.
- c. A 5% Bid security in the required form and amount must accompany the bid.
- d. Each blank for a unit price quotation for each item on the proposal must be filled in unless an alternative is provided. Each separate item must be bid on unless the proposal form clearly indicates otherwise.
- e. Bids must be submitted in sealed envelopes, plainly marked according to the instructions in the "Invitation to Bid" and must be received at the time and place specified for the bid closing.
- f. Proposals containing modifications, deletions, exceptions, or reservations which in any way conflict with or purport to alter any substantive provision contained in the bid documents will not be considered.
- g. Conditional bids will not be considered.
- h. Addenda, if issued, shall be signed and submitted with the bid. Recognizing addenda by numbering and signing the Proposal where indicated satisfies this requirement.
- i. Contractor/Subcontractor Section 3 Certification and Agreement.

**15. Bid Security**

The City reserves the right to retain the bid security of the three (3) lowest bidders until the successful bidder has signed and delivered the contract and furnished a one hundred percent (100%) Performance Bond and (100%) Payment Bond.

**16. Performance and Payment Bonds**

Unless the required bonds are waived under ORS 279C.380(1)(a), the successful Bidder shall file with the City at the time of execution of the Contract, a 100% Performance Bond and a 100% Payment Bond, each in a sum equal to the public improvement contract price. The surety company furnishing this bond shall have a sound financial standing and a record of service satisfactory to the City, and shall be authorized to do business in the State of Oregon. In lieu of a performance bond, the contractor may file a certified or cashier's check made payable to the City of Salem, Oregon. This check will be held by the City conditioned on and subject to the same provisions as set forth in the attached Performance Bond. This means that if you choose to provide a Cashier's or Certified check as a Performance Security that it will be held by the city for a period of one year just as a Performance Bond would be valid for a period of one year. After completion and final acceptance of the work required by the contract, a Warranty Bond, in a form and amount approved by the city Attorney, may be provided as a replacement for the Cashier's or Certified Check.

On each such bond the rate of premium shall be stated, together with the total amount of the premium charged. The current power of attorney for the person who signs for any surety company shall be attached to such bond.

17. **Value Engineering Change Proposal**

The successful bidder is encouraged to submit suggestions for contract changes which result in equal or superior functional performance and/or project quality at less cost. The "Value Engineering Change Proposal" process is provided for this purpose. The VECP form is to be submitted to the project engineer whenever a Contractor can identify an area of the project that he believes can be improved. Instructions for using the VECP form are provided herein. **These forms are not to be included with the bidder's proposal. They are to be submitted by the successful bidder after the execution of the contract.**

18. **Substitutions.**

- A. Each bidder represents that their bid is based upon the materials and equipment described in the bidding documents.
- B. No substitutions submitted by the bidder, will be considered unless written request has been received by the Contract Administrator for approval no later than **at 5:00 PM (local time)**. Each such request shall include a complete description of the proposed substitute; drawings, cuts, performance and test data; additions to, deductions from, or revisions in other's work necessitated by the use of proposed product; and any other data or information necessary for a complete evaluation. A copy of the "Substitution Request Form" appears at the end of this "Information for Bidders" and shall be used for this purpose.
- C. "Or approved equal" as denoted in the specifications shall mean the same as an approved substitution.
- D. Substitution Request forms shall only be considered when submitted by a bidder. If a Substitution Request form is submitted by a person/company other than a bidder, the form will not be considered and will be returned.
- E. If the Contract Administrator approves any proposed substitution, such approval will be set forth in Addenda listing manufacturer's materials and equipment approved for substitution.

19. **Observance/Compliance of Laws, Ordinances & Regulations**

The Contractor shall observe and comply with all Federal, State and local laws, ordinances, regulations and safety codes that in any manner affect the conduct of their work and shall indemnify and safe harmless SHA and all of its officers, agents and employees against any claim or liability arising from or based upon the violation of any such law, ordinance, or regulations whether by themselves or their employees. The Contractor shall be liable for all applicable Federal, State and local taxes.

20. **Protest Procedures**

After bids are opened and the determination is made by SHA to award a contract, a Notice of Intent to Award will be posted in the office of the Purchasing Administrator. Any protests of the intent to award this Contract must be filed with the City Manager in writing within seven (7) days after SHA issues a Notice of Intent to Award. If no notice of intent to award is issued, a bidder must deliver a written protest to the City Manager's Office, 555 Liberty Street SE, Room 220, within forty-eight hours after award. Any protest shall not be considered if filed with any

other person or office, and shall not be considered if received by the appropriate official after this time. No intent to award will be issued for this project.

The administrative review of protests is limited to disputes concerning SHA's contractor selection or contract award decision. This policy does not provide an administrative review process for any issues or concerns which could have been raised prior to the close of the solicitation.

To be adversely affected or aggrieved, a protester must claim that the protester was the highest ranked proposer eligible for selection, i.e., the protester must claim that all higher ranked proposers were ineligible for selection because their proposals were non-responsive or the proposers non-responsible. The City of Salem will not consider a selection protest submitted after a contract has been awarded.

In order to protest the award of the contract, a protestor must claim and prove the following:

- A. The protestor must be adversely affected by being eligible to be awarded the contract in the event the protest is successful; and
- B. All lower bids or higher ranked proposals were nonresponsive; the SHA failed to conduct the evaluation of proposals as described in the solicitation documents; the SHA abused its discretion in rejecting the protestor's bid or proposal as nonresponsive; or the SHA evaluation or subsequent determination of award violated ORS Chapter 279A or 279C.

The written protest must include a \$500.00 fee, as established in a schedule adopted by the City Manager to cover the costs of processing the protest.

A full description of the City's protest policy may be obtained by contacting the City Contracts and Procurement Division, telephone 503/588-6136, FAX 503/588-6400

21. **Incurring Costs**

Neither the City of Salem, nor its agents, are liable for any cost incurred by providers prior to issuance of an agreement, contract, or purchase order. All prospective providers who respond to a City of Salem procurement do so solely at the respondent's cost and expense.

22. **First-Tier Subcontractor Disclosure**

When required by ORS 279C.370, bidders shall submit the Disclosure Form provided herein. Reference the attached "Instructions for First-Tier Subcontractor Disclosure" for additional information and instructions. The disclosure of subcontracts on the proposal is insufficient to comply with ORS 279C.370.

23. **Addenda**

In the event that it becomes necessary to revise any part of this Bid document, addenda will be provided to all Proposers who received the original bid. The SHA is not responsible for any explanation, clarification, interpretation, or approval made or given in any manner except by addenda. Addenda, if necessary, will be issued not later than five (5) City business days prior to the bid closing date. Addenda shall be signed by the same individual that signed the proposal and **SHALL BE SUBMITTED** with the proposal. Proposals received without properly signed addenda will be considered non-responsive and will not be further considered for contract award.

24. **Laws of the State of Oregon**

By submitting a response to this solicitation, Bidder/Proposer agrees that:

Any terms and conditions stated within any agreement that is awarded as a result of this solicitation shall also include the following:

The following laws of the State of Oregon are hereby incorporated by reference into the Agreement: ORS 279C.505(1), ORS 279C.505(2), ORS 279C.510(1), ORS 279C.510(2), ORS 279C.515, ORS 279C.520, ORS 279C.525, ORS 279C.530, ORS 279C.540, ORS 279C.545, ORS 279C.830, and ORS 279C.840, are, by this reference, incorporated in and made a part of this proposal.

Any contract awarded and/or purchase order issued as a result of this solicitation shall be governed by the laws of the State of Oregon. Exclusive venue for litigation of any action arising under the agreement shall be in the Circuit Court of the State of Oregon for Marion County. The City of Salem and vendor expressly waive any and all rights to maintain an action under the agreement in any other venue and expressly consent that, upon motion of the other party, any case may be dismissed or its venue transferred, as appropriate, so as to effectuate the choice of venue made in this section.

25. **Insurance**

The Contractor shall not commence work under this contract until they have furnished the SHA with satisfactory proof of the insurance. See Sample Insurance form in bid packet.

- a. WORKERS' COMPENSATION LAW: Pursuant to ORS 279.320(2), all subject employers working under this contract are either employers that will comply with ORS 656.017 or employers that are exempt under ORS 656.126.

26. **Debarment of Bidder**

The Purchasing Administrator may debar prospective bidders from consideration for contracts for a period of not more than three years if:

- (1) The prospective bidder has been convicted of a criminal offense as an incident in obtaining or attempting to obtain a public or private contract or subcontract or in the performance of such contract or subcontract;
- (2) The bidder has been convicted under state or federal statutes of embezzlement, theft, forgery, bribery, falsification or destruction of records, receiving stolen property or any other offense indicating a lack of business integrity or business honesty that currently, seriously and directly affects the prospective bidder's or proposer's responsibility as a contractor;
- (3) The prospective bidder has been convicted under state or federal antitrust statutes;
- (4) The prospective bidder has committed a violation of a contract provision and debarment for such a violation was listed in the contract terms and conditions as a potential penalty. A violation may include, but is not limited to, a failure to perform the terms of a contract or an unsatisfactory performance of the terms of the contract. A failure to perform or an unsatisfactory performance caused by acts beyond the control of the contractor may not be considered to be a basis for debarment; or
- (5) The prospective bidder does not carry workers' compensation or unemployment insurance as required by applicable law.

The Purchasing Administrator shall give written notice of the reasons for the debarment and the proposed length of debarment to the person for whom debarment is being considered. The bidder shall be given not less than fourteen days to respond to the Purchasing Administrator in writing. The Purchasing Administrator shall issue a written decision that states the reason for the action taken and that informs the bidder of the bidder's appeal rights.

27. **Bidding by City Employees Prohibited**

The City will not purchase any goods or services from City employees unless City Council expressly authorizes the purchase or the purchase is necessary during a state of emergency and the City Manager approves the purchase.

28. **HUMAN RIGHTS.** It is the express policy of the City that no person shall, on the grounds of race, religion, color, creed, sex, marital status, familial status or domestic partnership, national origin, age, mental or physical disability, sexual orientation, gender identity, or source of income, suffer discrimination in the performance of this Agreement when employed by Contractor. Contractor agrees to comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations, including Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, the Federal Aid Highway Act of 1973, Age Discrimination Act of 1975, the Americans with Disabilities Act of 1990, Section 504 of the Rehabilitation Act of 1973, Executive Order 12898, and Executive Order 13166. Further, Contractor agrees not to discriminate against minority-owned, women-owned, or emerging small businesses or against a business enterprise that is owned or controlled by or that employs a disabled veteran in awarding subcontracts as required by ORS 279A.110. The City's complete Title VI Plan may be viewed at  
<http://www.cityofsalem.net/NonDiscrimination/Pages/default.aspx>.

**Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract, Salem Revised Code Chapter 97, Title VI of the Civil Rights Act of 1964, and other federal nondiscrimination laws.

29. **SECTION 3**

The conditions of paragraph 40 of the General Conditions of the Contract for Construction, form HUD-5370 apply to this contract. **Although any qualified bidder may submit a bid for this contract, preference is given to Section 3 contractors.** Bidders claiming Section 3 status must so certify on the Contractor/Subcontractor Section 3 Certification and Agreement form.

~~The successful bidder will be required to submit a Section 3 Opportunities Plan describing how the contractor will meet the Section 3 requirements of this contract.~~

~~Ways to find Section 3 residents include:~~

- ~~a. Flyers (unemployment office, union hall, food stamp office, AFS office)~~
- ~~b. Posters (Posted at job site and at all developments)~~
- ~~c. Meetings in Public Housing Developments~~
- ~~d. Media Advertising~~
- ~~e. Employment Agencies~~

SUBSTITUTION REQUEST FORM  
(Submitted by Proposers/Bidders Only)

**TO:** *The City of Salem*  
*Contracts & Procurement Administrator*  
*555 Liberty St. S.E./Room 330*  
*Salem, OR 97301-3503*  
*Fax: 503-588-6400*

BID NO. 134046

Substitution Request Forms must be received no later than at 5:00 PM (local time).

Bid Title: **SOUTHEAIR APARTMENTS MODERNIZATION PROJECT**  
Specified Item:

Section Page Paragraph Description

The undersigned Proposer/Bidder submits and requests consideration and determination of the following proposed substitution as an "Approved Equal" for the Specified Item:

PROPOSED SUBSTITUTION: \_\_\_\_\_  
*Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified. The City reserves the right to request additional information of a clarifying nature.*

*Attached data also includes description of changes to contract documents which proposed substitution will require for its proper installation or use.*

The undersigned states that the following paragraphs, unless modified on the attachments are correct:

1. *The proposed substitution does not change the quality from the product description in the bid specifications.*
2. *The proposed substitution will have no adverse affects when used with existing product(s) described within the specifications, or with delivery schedule, or specified warranty requirements.*
3. *Support, maintenance, and service parts will be locally available for the proposed substitution.*
4. *References from satisfied users of the proposed substitution item shall be made available to the City of Salem with this request form.*

The undersigned further states that the function, appearance and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by:

For use by Contract Administrator

Signature \_\_\_\_\_

Accepted       Accepted as noted  
 Not accepted       Received too late

Firm \_\_\_\_\_

By \_\_\_\_\_  
*Contract Administrator*

Address \_\_\_\_\_

Date \_\_\_\_\_

Date \_\_\_\_\_

Remarks \_\_\_\_\_

Telephone \_\_\_\_\_

\_\_\_\_\_

Fax \_\_\_\_\_

\_\_\_\_\_

## **INSTRUCTIONS FOR FIRST-TIER SUBCONTRACTOR DISCLOSURE:**

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Bidders are required to disclose information about certain first-tier subcontractors when the contract value for a Public Improvement is greater than \$100,000 (see ORS 279C.370). Specifically, when the contract amount of a first-tier subcontractor is greater than or equal to: i) 5% of the project bid, but at least \$15,000, or ii) \$350,000 regardless of the percentage, you must disclose the following information about that subcontract within two (2) City business hours of bid CLOSING/ OPENING:

- a) The subcontractor's name and address,
- b) The subcontractor's Construction Contractor Board (CCB) registration number if one is required, and
- c) The subcontractor dollar value.

If you will not be using any subcontractors that are subject to the above disclosure requirements, you are required to indicate "NONE" on the accompanying form. Sub-contractor(s) supplying materials only, without performing work on the project, need not be listed.

**THE CITY MUST REJECT A BID IF THE BIDDER FAILS TO SUBMIT THE DISCLOSURE FORM WITH THIS INFORMATION BY THE STATED DEADLINE, EVEN IF "NONE" IS INDICATED ON THE FORM.**

To determine disclosure requirements, the City recommends that you disclose subcontract information for any subcontractor as follows:

- 1) Determine the lowest possible contract price. That will be the base bid amount less all deductive alternate bid amounts (exclusive of any options that can only be exercised after contract award), if any.
- 2) Provide the required disclosure information for any first-tier subcontractor whose potential contract services (subcontractor base bid amount plus all additive alternate bid amounts, exclusive of any options that can only be exercised after contract award, if any) are greater than or equal to:
  - a) 5% of that lowest contract price, but at least \$15,000 or
  - b) \$350,000 regardless of the percentage.

Total all possible work for each subcontractor in making this determination (e.g., if a subcontractor will provide \$15,000 worth of services on the base bid and \$40,000 on an additive alternate bid amounts, then the potential amount of subcontractor's service is \$55,000. Assuming that \$55,000 exceeds 5% of the lowest contract price, provide the disclosure for both the \$15,000 services and the \$40,000 services).

## FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM

PROJECT NAME: SOUTHFAIR APARTMENTS MODERNIZATION PROJECT

BID #: 134046 BID CLOSING/ OPENING:

REQUIRED DISCLOSURE DEADLINE: Date: [Type Disclosure Deadline Date] Time: [Type Disclosure deadline time AM or PM]

This form must be submitted in a sealed envelope at the location specified in the Invitation to Bid on the bid closing date and within two (2) City business hours after the bid closing time.

List below the Name, Address, Dollar Value, Construction Contractor Board (CCB) number if required, Contact Name and Telephone Number of each subcontractor that will be furnishing labor or labor and materials that are required to be disclosed and the category of work that the subcontractor will be performing. Sub-contractor(s) supplying materials only, without performing work on the project, need not be listed. Enter "NONE" if there are no subcontractors that need to be disclosed. ATTACH ADDITIONAL SHEETS IF NECESSARY.

### BIDDER DISCLOSURE:

SUBCONTRACTOR NAME/ ADDRESS	CATEGORY OF WORK/ CCB #	DOLLAR VALUE
1. _____	_____	\$ _____
	CCB# _____	
2. _____	_____	\$ _____
	CCB# _____	
3. _____	_____	\$ _____
	CCB# _____	

The above listed first-tier subcontractor(s) are providing labor or labor and materials with a Dollar Value equal to or greater than:

- a) 5% of the total Contract Price, but at least \$15,000 (including all alternates). If Dollar Value is less than \$15,000 do not list the subcontractor above; or
- b) \$350,000 regardless of the percentage of the total Contract Price.

**FAILURE TO SUBMIT THIS FORM BY THE DISCLOSURE DEADLINE WILL RESULT IN A SUBMITTED BID BECOMING NON-RESPONSIVE AND SUCH BIDS SHALL NOT BE CONSIDERED FOR AWARD.**

Bids which are submitted by Bid Closing, but for which the disclosure submittal form(s) has not been made by the specified deadline, are not Responsive and shall not be considered for Contract Award.

Form Submitted By (Bidder Name): \_\_\_\_\_

Contact Name: \_\_\_\_\_ Phone #: \_\_\_\_\_

DELIVER FORM TO:  
CONTRACTS & PROCUREMENT DIVISION  
555 LIBERTY ST SE, ROOM 330  
SALEM, OR 97301

# VALUE ENGINEERING CHANGE PROPOSAL (VECP)

Project: \_\_\_\_\_

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

Original Contract Price: \_\_\_\_\_ Contract No.: \_\_\_\_\_

Net Change Order Cost: \_\_\_\_\_ P.O. No.: \_\_\_\_\_

Net Contract Price: \_\_\_\_\_ \$0.00 Budget No.: \_\_\_\_\_

Project No.: \_\_\_\_\_

---

**Description of Existing Contract Requirements:**

---

**Description of Proposed Change (Include list of contract provisions that must be changed):**

---

**Discussion of Difference** (List advantages and disadvantages, justify any changes to function or characteristics, explain effect of change on performance. Include effects on any collateral functions or equipment):

---

**Life-cycle Cost** (State effect of change on cost of operation and maintenance through life-cycle of the

**Deadline for Implementation of Value Engineering Change Proposal** (State latest time for approval of Change Order implementing the value engineering change proposal in order to obtain maximum cost reduction. Discuss effects on the contract completion date or on the delivery date of any required material or equipment):

---

**Cost Analysis** (Provide supporting documents):

- a) Cost of performing the Work in accordance with existing requirement: \_\_\_\_\_
  - b) Cost of performing the Work in accordance with proposed value engineering change proposal: \_\_\_\_\_
  - c) Gross savings to CONTRACTOR (GS): \_\_\_\_\_ \$0.00
  - d) CONTRACTOR's Costs (CC): \_\_\_\_\_
  - e) Net Savings to Contract (NS)=(GS)-(CC): \_\_\_\_\_ \$0.00
  - f) Estimated OWNER's Cost (OC): \_\_\_\_\_
- Net Contract Price Change Proposed by CONTRACTOR:** \_\_\_\_\_
- Net Contract Time Change Proposed by CONTRACTOR:** \_\_\_\_\_ days

1. **Definitions:**

- A. **Gross Savings to the CONTRACTOR (GS):** The difference between cost of performing the work according to the existing Contract requirements and the cost if performed according to the proposed change.
  - B. **CONTRACTOR's Costs (CC):** Costs incurred by the CONTRACTOR and/or Subcontractors in preparing and implementing the VECP.
  - C. **Net Savings to CONTRACTOR (NS):** Gross savings (GS) minus CONTRACTOR's costs (CC).
  - D. **Owner's (City's) Costs (OC):** Costs incurred by the OWNER for evaluating and implementing the VECP, such as testing, redesign, administration, and, if required, Design Consultant costs.
- 

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

**CONTRACT**

THIS AGREEMENT made this \_\_\_\_\_ day of \_\_\_\_\_, in the year Two Thousand and Thirteen by and between \_\_\_\_\_ a corporation organized and existing under the laws of the State of \_\_\_\_\_ a partnership consisting of \_\_\_\_\_, or an individual trading as hereinafter called the "Contractor", and the HOUSING AUTHORITY OF THE CITY OF SALEM hereinafter called the "SHA".

WITNESSETH, That the Contractor and the SHA for the consideration stated herein mutually agree as follows:

ARTICLE 1. Statement of Work. The Contractor shall furnish all labor, material, equipment and services, and perform and complete all work required for the SOUTHFAIR APARTMENTS MODERNIZATION PROJECT, in strict accordance with the specifications and the drawings, all as prepared by CB Two Architects, Kirk Sund, 500 Liberty Street SE, Suite 100, Salem, Oregon 97301, 503-480-8700, which said Specifications, and Drawings and any Addenda thereto numbered \_\_\_\_\_ and \_\_\_, dated \_\_\_\_\_ and \_\_\_\_\_ are incorporated herein by reference and made a part hereof.

The Bidder agrees to commence work under this contract following a written "Notice to Proceed" of the SHA and to fully complete all work specified and shown on the drawings for SOUTHFAIR APARTMENTS MODERNIZATION PROJECT within SIXTY (60) consecutive calendar days after the "Notice to Proceed."

Bidder further agrees to pay as liquidated damages, the sum indicated on the following schedule for each consecutive calendar day thereafter until the work is completed and accepted:

<b>Original Amount of Contract</b>	<b>Schedule of Liquidated Damages</b>	
<i>For more than</i>	<i>to and including</i>	<i>Daily Amount / Calendar Day</i>
\$ 0...	\$ 25,000...	\$ 45.00
\$ 25,000...	\$ 50,000...	\$ 60.00
\$ 50,000...	\$ 100,000...	\$ 90.00
\$ 100,000...	\$ 500,000...	\$ 185.00
\$ 500,000...	\$ 1,000,000...	\$ 275.00

<i>For more than</i>	<i>to and including</i>	<i>Daily Amount / Calendar Day</i>
\$ 0...	\$ 25,000...	\$ 45.00
\$ 25,000...	\$ 50,000...	\$ 60.00
\$ 50,000...	\$ 100,000...	\$ 90.00
\$ 100,000...	\$ 500,000...	\$ 185.00
\$ 500,000...	\$ 1,000,000...	\$ 275.00

ARTICLE 2. The Contract Price. The SHA shall pay the Contractor for the performance of the Contract, in current funds, subject to additions and deductions as provided in the Specifications, the sum of:

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

ARTICLE 3. Contract Documents. The Contract shall consist of the following component parts:

- a. This Instrument
- b. Invitation for Bids
- c. Instructions to Bidders
- d. Performance and Payment Bonds
- e. Bid Proposal
- f. General Conditions
- g. Technical Specifications
- h. Drawings

This instrument, together with the other documents enumerated in this Article 3, which said other documents are as fully a part of the Contract as if hereto attached or herein repeated, form the Contract. In the event that any provision of any other component part of this Contract conflicts with any provision of any other component part, the provision of the component part first enumerated in this Article 3 shall govern, except as otherwise specifically stated. The various provisions in Addenda shall be construed in the order of preference of the component part of the Contract which each modifies.

ARTICLE 4. Any prevailing wage rate (including basic hourly rate and fringe benefits) determined under the State or tribal law to be prevailing with respect to an employee in any trade or position employed under the contract is inapplicable to the contract and shall not be enforced against the contractor or any subcontractor with respect to employees engaged under the contract whenever either of the following occurs:

- (I) Such non-Federal prevailing wage rate exceeds (A) the applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 27a et seq.) to be prevailing in the locality with respect to such trade; (B) an applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the Department of Labor or a DOL-recognized State Apprenticeship Agency; or (C) an applicable trainee wage rate based thereon specified in a DOL-certified trainee program; or;
- (ii) Such nonfederal prevailing wage rate, exclusive of any fringe benefits, exceeds the applicable wage rate determined by the Secretary of HUD to be prevailing in the locality with respect to such trade or position.

ARTICLE 5. The Contractor shall demonstrate that an employee drug testing program is in place.

**ARTICLE 6. LAWS OF THE STATE OF OREGON.** By submitting a response to this solicitation, Bidder/Proposer agrees that:

Any terms and conditions stated within any agreement that is awarded as a result of this solicitation shall also include the following:

- \* The Bidder agrees that all of the applicable provisions of Oregon Law relating to public contracts ORS 279C.505(1), ORS 279C.505(2), ORS 279C.510(1), ORS 279C.510(2), ORS 279C.515, ORS 279C.520, ORS 279C.525, ORS 279C.530, ORS 279C.540, ORS 279C.545, ORS 279C.830, and ORS 279C.840, are, by this reference, incorporated in and made a part of this Proposal.
- \* The undersigned agrees that the agreement shall be governed by the laws of the State of Oregon. Exclusive venue for litigation of any action arising under the agreement shall be in the Circuit Court of the State of Oregon for Marion County unless exclusive jurisdiction is in federal court, in which case exclusive venue shall be in the federal district court for the district of Oregon. The City of Salem and vendor expressly waive any and all rights to maintain an action under the agreement in any other venue and expressly consent that, upon motion of the other party, any case may be dismissed or its venue transferred, as appropriate, so as to effectuate this choice of venue.

**ARTICLE 7. HUMAN RIGHTS**

Contractor hereby agrees that no person shall, on the grounds of race, religion, color, creed, sex, marital status, familial status or domestic partnership, national origin, age, mental or physical disability, sexual orientation, gender identity, or source of income, suffer discrimination in the performance of this Agreement when employed by Contractor. Contractor agrees to comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations, including Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, the Federal Aid Highway Act of 1973, Age Discrimination Act of 1975, the Americans with Disabilities Act of 1990, Section 504 of the Rehabilitation Act of 1973, Executive Order 12898, and Executive Order 13166. Further, Contractor agrees not to discriminate against minority-owned, women-owned, or emerging small businesses or against a business enterprise that is owned or controlled by or that employs a disabled veteran in awarding subcontracts as required by ORS 279A.110.

**Solicitations for Subcontracts, Including Procurements of Materials and**

**Equipment:** In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract, Salem Revised Code Chapter 97, Title VI of the Civil Rights Act of 1964, and other federal nondiscrimination laws.

**IN WITNESS WHEREOF**, the parties hereto have caused This Instrument to be executed in four (4) original counterparts as of the day and year first above written.

\_\_\_\_\_  
(Contractor's Signature)

ATTEST: (Secretary)

By: \_\_\_\_\_

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

Business Address:

\_\_\_\_\_  
(Street)

\_\_\_\_\_  
(City)                    (State)                    (Zip Code)

\_\_\_\_\_  
(Telephone Number)

*NOTE: If the Contractor is a Corporation, the Secretary should attest.*

**HOUSING AUTHORITY OF THE  
CITY OF SALEM**

By: \_\_\_\_\_  
Linda Norris  
Title: Executive Director

**Certifications**

I, \_\_\_\_\_, certify that I am the \_\_\_\_\_  
of the corporation named as Contractor herein;  
that \_\_\_\_\_, who signed this Contract on behalf of the Contractor, was then  
of said corporation; that said Contract was duly signed for and in behalf of said corporation by authority  
of its governing body, and is within the scope of its corporate powers.

Corporate Seal/ Notary



(Print or type the names underneath all signatures.)

THE HOUSING AUTHORITY OF THE CITY OF SALEM  
("SHA")

STANDARD PUBLIC IMPROVEMENT CONTRACT

PERFORMANCE BOND

Bond No. \_\_\_\_\_

Amount:\$ \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS that we \_\_\_\_\_, as Principal (Contractor), and \_\_\_\_\_, a corporation organized and existing under the laws of the State of \_\_\_\_\_, and duly authorized to transact a SURETY business in the State of Oregon, as SURETY, are held and firmly bound unto the SHA, in the sum \_\_\_\_\_ DOLLARS, (\$) \_\_\_\_\_ lawful money of the United States of America, for the payment whereof well and truly to be made, we and each of us, jointly and severally, bind ourselves, our and each of our heirs, executors, administrators, successors and assigns firmly by these presents.

THE CONDITIONS of this obligation are such that, whereas the above Principal did on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ enter into a Contract with the SHA for

which Contract is made a part hereof as if fully copied herein;

NOW, THEREFORE, if the said principal faithfully, punctually and completely performs and abides by all covenants and conditions of said Contract, and with all laws, ordinances, regulations, and orders of the State of Oregon and the SHA, and the agencies and bureaus thereof, directly or indirectly governing or applicable to the Principal's performance under the said Contract, including but not limited to the requirements of Oregon Revised Statutes Chapter 279C relating to public contracts, which hereby is made a part hereof as if fully copied herein, then this obligation shall be null and void, otherwise to be in full force and effect.

SURETY agrees (1) that any extension of time allowed said Principal for completion of work or for delivery under the said contract shall not impair this obligation or reduce any period of maintenance or warranty provided in said Contract; (2) that any change made in the terms or provisions of said contract increasing the price to be paid to Principal, without notice to the SURETY shall not impair this obligation, but any such change shall automatically increase the obligation of the SURETY hereunder in a like amount; and (3) that this obligation shall continue to bind the said Principal and SURETY notwithstanding successive payment made hereunder for successive breaches, until the full amount of the said obligation is exhausted.

IN WITNESS WHEREOF, the Principal and Surety have caused these presents to be executed on this  
\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

**PRINCIPAL**

BY \_\_\_\_\_

TITLE \_\_\_\_\_

**SURETY**

BY \_\_\_\_\_

Attorney-in-Fact

**COUNTERSIGNED:**

Oregon Resident Agent

Address

**NOTE**

If the Principal is operating under an assumed business name there must also be set forth in the first paragraph of the bond, the names of all the partners or the individuals owning the business, and the bond must be executed by one of them.

If the Principal is a corporation, the bond must be executed by one of the officers authorized to execute bonds, showing his official title and the seal of the corporation.

The bond must be executed by an attorney-in-fact for the surety company, showing on the face thereof the Oregon agent for service, and bear the seal of the surety company. Where the bond is executed by a person outside the state of Oregon, his authority to execute bonds should be shown.

THE HOUSING AUTHORITY OF THE CITY OF SALEM  
("SHA")

STANDARD PUBLIC IMPROVEMENT CONTRACT

P A Y M E N T   B O N D

Bond No. \_\_\_\_\_

Amount:\$ \_\_\_\_\_

KNOW ALL MEN BY THESE PRESENTS that we \_\_\_\_\_, as Principal (Contractor), and \_\_\_\_\_, a corporation organized and existing under the laws of the State of \_\_\_\_\_, and duly authorized to transact a SURETY business in the State of Oregon, as SURETY, are held and firmly bound unto the SHA, in the sum \_\_\_\_\_ DOLLARS, (\$ \_\_\_\_\_) lawful money of the United States of America, for the payment whereof well and truly to be made, we and each of us, jointly and severally, bind ourselves, our and each of our heirs, executors, administrators, successors and assigns firmly by these presents.

THE CONDITIONS of this obligation are such that, whereas the above Principal did on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ enter into a Contract with the SHA for which Contract is made a part hereof as if fully copied herein;

NOW, THEREFORE, if the said principal faithfully, punctually and completely performs and abides by all covenants and conditions of said Contract, and with all laws, ordinances, regulations, and orders of the State of Oregon and the SHA, and the agencies and bureaus thereof, directly or indirectly governing or applicable to the Principal's performance under the said Contract, including but not limited to the requirements of Oregon Revised Statutes Chapter 279C relating to public contracts, which hereby is made a part hereof as if fully copied herein, and shall make payment promptly, as due, to the SHA and all other public entities as may be required, and to all subcontractors and to all persons supplying to the Principal or his(its) subcontractors, equipment, supplies, labor, or materials for the prosecution of the work or any part thereof, provided for in said Contract, then this obligation shall be null and void, otherwise to be in full force and effect.

SURETY agrees (1) that any extension of time allowed said Principal for completion of work or for delivery under the said contract shall not impair this obligation or reduce any period of maintenance or warranty provided in said Contract; (2) that any change made in the terms or provisions of said contract increasing the price to be paid to Principal, without notice to the SURETY shall not impair this obligation,

but any such change shall automatically increase the obligation of the SURETY hereunder in a like amount, and (3) that this obligation shall continue to bind the said Principal and SURETY notwithstanding successive payment made hereunder for successive breaches, until the full amount of the said obligation is exhausted.

IN WITNESS WHEREOF, the Principal and Surety have caused these presents to be executed on this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

PRINCIPAL

BY \_\_\_\_\_

TITLE \_\_\_\_\_

SURETY

BY \_\_\_\_\_

Attorney-in-Fact

COUNTERSIGNED:

Oregon Resident Agent

Address

NOTE

If the Principal is operating under an assumed business name there must also be set forth in the first paragraph of the bond, the names of all the partners or the individuals owning the business, and the bond must be executed by one of them.

If the Principal is a corporation, the bond must be executed by one of the officers authorized to execute bonds, showing his official title and the seal of the corporation.

The bond must be executed by an attorney-in-fact for the surety company, showing on the face thereof the Oregon agent for service, and bear the seal of the surety company. Where the bond is executed by a person outside the state of Oregon, his authority to execute bonds should be shown.

## Exhibit I

### **ACCEPTABILITY OF INSURERS**

Insurance is to be placed with insurers with a current A. M. Best's rating of no less than B+:VI. Bidders must provide written verification of their insurer's rating.

### **VERIFICATION OF COVERAGE**

Contractor shall furnish the Authority with original certificates and amendatory endorsements effecting coverage required by these specifications. The endorsements should conform fully to the requirements. All certificates and endorsements are to be received and approved by the Authority in sufficient time before work commences to permit Contractor to remedy any deficiencies. The Authority reserves the right to require complete, certified copies of all required insurance policies, including endorsements effecting the coverage required by these specifications at any time.

### **SUB-CONTRACTORS**

Use of sub-contractors must be pre-approved by the Authority. Contractor shall include all sub-contractors as insureds under its policies or shall furnish separate insurance certificates and endorsements for each sub-contractor in a manner and in such time as to permit the Authority to approve them before sub-contractors' work begins. All coverages for sub-contractors shall be subject to all of the requirements stated above.

**NOTE:** The General Contractor's Commercial General Liability insurance should not include CG 2294 or CG 2295 as these endorsements will eliminate the General Contractor's insurance coverage for its work where the damaged work or the work out of which the damage arises was performed by a sub-contractor.

Notwithstanding this provision, Contractor shall indemnify the Authority for any claims resulting from the performance or non-performance of the Contractor's sub-contractors and/or their failure to be properly insured.

**GENERAL LIABILITY  
ADDITIONAL INSURED ENDORSEMENT**

**HOUSING AUTHORITY OF THE CITY OF SALEM**

NAMED INSURED AND ADDRESS:

General description of agreement(s) and/or activity insured:

Notwithstanding any inconsistent statement in the policy to which this endorsement is attached or in an endorsement now or hereafter attached thereto, it is agreed as follows:

1. The Housing Authority of the City of Salem (the Authority), its Board of Commissioners, officers, agents and employees are insured thereunder in relation to those operations, uses, occupations, acts, and activities described generally above with regard to operations performed by or on behalf of the named insured.
2. Such insurance shall be primary, and not contributing with any other insurance maintained by the Authority notwithstanding any inconsistent provisions in any such policies maintained by the Authority and shall not require contribution by any insurance maintained by the Authority on any basis, pro rata, or otherwise.
3. The policy to which this endorsement is attached shall apply separately to each insured against whom claim is made or suit is brought except with respect to the limits of the company's liability.
4. The policy to which this endorsement is attached shall not be subject to cancellation, change in coverage, reduction of limits or non-renewal except after written notice to the Housing Administrator by certified mail, return receipt requested, not less than (30) days prior to the effective date thereof.

Address Cancellation Notice and Issue Endorsement to:

Housing Authority of the City of Salem  
Andy Wilch, Housing Administrator  
P. O. Box 808  
Salem, OR 97308-0808

Except as stated above and not in conflict with this endorsement, nothing contained herein shall be held to waive, alter or extend any of the limits, agreements, or exclusions of the policy to which this endorsement is attached.

Endorsement No.:	Effective Date:	Policy No.:
------------------	-----------------	-------------

ACCORD	CERTIFICATE OF LIABILITY INSURANCE			DATE (MM/DD/YY)	
PRODUCER		THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERNS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.			
		COMPANIES AFFORDING COVERAGE			
INSURED		COMPANY A	Insurance Co.		
		COMPANY B			
		COMPANY C			
		COMPANY D			
COVERAGES					
THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED NOTWITHSTANDING ANY REQUIREMENTS, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN. THE INSURANCE AFFORDED BY THE POLICIES DESIRED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.					
CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
A	GENERAL LIABILITY	01AP09476510	06/01/2013	06/01/2014	GENERAL AGGREGATE \$ 500,000
	X COMMERCIAL GENERAL LIABILITY				PRODUCTS - COMP/OP AGG \$ 500,000
	<input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR				PERSONAL & ADV INJURY \$ 500,000
	<input type="checkbox"/> OWNER'S & CONT. PROT				EACH OCCURRENCE \$ 500,000
	<input type="checkbox"/>				FIRE DAMAGE (Any one fire) \$ 50,000
<input type="checkbox"/>	MED EXP (Any one person) \$ 5,000				
A	AUTOMOBILE LIABILITY (Check the appropriate coverage.)	01CC3902013	06/01/13	06/01/08	COMBINED SINGLE LIMIT \$ 500,000
	X ANY AUTO				BODY INJURY (PER PERSON) \$
	<input type="checkbox"/> ALL OWNED AUTOS				BODILY INJURY (PER ACCIDENT) \$
	X SCHEDULED AUTOS				PROPERTY DAMAGE \$
	X HIRED AUTOS				
<input type="checkbox"/> NON OWNED AUTO					
<input type="checkbox"/> GARAGE LIABILITY	<input type="checkbox"/> ANY AUTO				AUTO ONLY - EA ACCIDENT \$
					OTHER THAN AUTO ONLY: \$
					EACH ACCIDENT \$
					AGGREGATE \$
<input type="checkbox"/> WORKER'S COMPENSATION AND EMPLOYEE'S LIABILITY	WC2249276G	06/01/13	06/01/14	WC STATUTORY LIMITS	
				OTHER	
				EL EACH ACCIDENT \$ 500,000	
				EL DISEASE - POLICY LIMIT \$ 500,000	
				EA DISEASE - EA EMPLOYEE \$ 500,000	
OTHER					
DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / SPECIAL ITEMS					
The Salem Housing Authority of the City of Salem, its officers, agents and employees are named as additional insured with respect to work performed on their behalf by the insured.					
CERTIFICATE HOLDER CITY OF SALEM CONTRACTS & PROCUREMENT DIVISION 555 LIBERTY ST SE, Room 330 SALEM, OR 97301-3503			CANCELLATION SHOULD ANY OF THE ABOVE DESCRIBED POLICES BE CANCELED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.		
			Authorized Signature: Vera Goff Vera Goff		

## City of Salem Equal Opportunity Policy For Contractors

### 1. Non-Discrimination Policy, General.

It is the policy of the City of Salem to eliminate discrimination based on race, religion, color, sex, marital status, familial status, national origin, age, mental or physical disability, sexual orientation, gender identity and source of income. The City Council finds that such discrimination poses a threat to the health, safety and general welfare of the citizens of Salem and menaces the institutions and foundation of our community. Furthermore, the City Council finds that although the State of Oregon generally prohibits discrimination in employment, housing, and public accommodation on the basis of race, religion, color, sex, marital status, familial status, national origin, age, and disability, the State does not generally prohibit such discrimination on the basis of sexual orientation, gender identity, domestic partnership, or source of income. It is the intent of the Council to supplement the state protections against discrimination. Furthermore, it is the intent of the Council, in the exercise of its powers for the protection of the public health, safety, and general welfare and for the maintenance of peace and good government, that every individual shall have an equal opportunity to participate fully in the life of the City and that discriminatory barriers to equal participation in employment, housing, and public accommodations be removed. (Ord No. 36-2002)

This policy is reinforced by obligations assumed by the City as a condition of receipt of federal and state funds. This policy thus becomes an obligation which must be assumed by the Contractor as well. Because in some cases religion, sex, age, or disability may properly be the basis for denial or restriction of privileges with respect to employment, housing, or public services, facilities, or accommodations, the following more specific obligations, terms and conditions shall apply.

### 2. Discrimination Because of Religious Belief.

With respect to terms and conditions of employment and hiring only, the Contractor shall be deemed to have complied with the general obligation of according equal opportunity without regard to religion if every reasonable effort has been made to accommodate the particular religious beliefs or practices of an employee or applicant for employment, but such accommodations cannot be made without undue hardship to the employer.

### 3. Discrimination Because of Sex.

With respect to terms and conditions of employment and hiring only, the Contractor shall be deemed to have complied with the general obligation of according equal opportunity notwithstanding any rule, standard, practice, or decision which accords an employee or applicant different treatment because of sex, if such rule, standard, practice, or decisions is

based upon a bona fide occupational qualification which the employer cannot, without undue hardship, modify or waive to accommodate the employee or applicant.

With respect to housing and to public services, facilities and accommodations, the Contractor shall be deemed to have complied with the general obligation of according equal opportunity notwithstanding any rule, standard, practice, or decision which restricts or limits access to such on the basis of sex where:

- (a) Physical facilities such as restrooms, bathing facilities, dressing rooms, etc. must be segregated on the basis of sex to accord personal privacy or comply with local, state, or federal law, or ordinance, or administrative regulation; or
- (b) The content or subject matter of a program or service is clearly of benefit to persons of a particular sex only because it deals with medical, psychological, or sociological factors inherently linked to the characteristics of one sex only, or its effectiveness in providing benefit to persons of one sex would be unreasonably and adversely affected by the participation of persons of the opposite sex.

#### 4. Discrimination Because of Disability.

With respect to terms and conditions of employment and hiring only, the Contractor shall be deemed to have complied with the general obligation of according equal opportunity to persons who are physically or mentally disabled if every reasonable effort has been made to accommodate any physical or mental disabilities of an employee or applicant, but such accommodations cannot be made without undue hardship to the employer; or where, because of such disability, the employee or applicant cannot meet a bona fide occupational qualification that cannot be waived or modified without hardship to the employer.

With respect to housing and to public services, facilities, and accommodations only, the Contractor shall be deemed to have complied with the general obligation of according equal opportunity to persons who are physically or mentally disabled where:

- (a) Architectural barriers limiting access to facilities owned or occupied by the Contractor cannot be eliminated without structural alterations, and are permitted to remain under the provisions of the Oregon State Structural Specialty Code; or
- (b) A program or activity, viewed in its entirety, is readily accessible to and usable by persons who are physically or mentally disabled.
- (c) The purpose of the program, service, or facility is to provide a special benefit to persons characterized by a particular disability in some respect specially related to the educational, medical, psychological, mobility, social, or economic needs of persons so disabled.

## 5. Discrimination Because of Age.

With respect to terms and conditions of employment and hiring only, the Contractor shall be deemed to have complied with the general obligation of according equal opportunity regardless of age where:

- (a) Certain positions include duties which must, by law or ordinance, be performed by persons over a certain age, and the employer cannot accommodate the employment of a person under that minimum age without undue hardship;
- (b) The employee or applicant has passed any applicable age established by the Congress of the United States beyond which an employer may reject an employment application or mandate an employee's retirement.

With respect to housing and to public services, facilities and accommodations only, the Contractor shall be deemed to have complied with the general obligation of according equal opportunity without regard to age where:

- (a) The purpose of the service, facility, or accommodation is to benefit or serve persons under 18 years of age or their adult custodians in some respect specially related to the needs of such person; or
- (b) The purpose of the service, facility, or accommodation is to benefit or serve persons 65 years of age or older in some respect specially related to the educational, medical, psychological, mobility, social, or economic needs common to persons of that age group.

## 6. Definitions.

As used in this Policy, there are several terms specifically defined in various federal, state, and local laws, ordinances, and administrative regulations applicable either because of the City's receipt of federal or state funds, or because they are general laws and ordinances prohibiting discrimination. In addition, judicial and administrative decisions have created an additional body of law further defining these terms in their application. Because of the magnitude and complexity of these various legal definitions and interpretations, it is not possible to provide exhaustive definitions herein. The Contractor should be guided by the following general rules:

- (a) Where two separate legal definitions or interpretations may apply in a given situation, the one according the greatest degree of protection to the person entitled to their protection shall govern.
- (b) "Disability" and "handicap" are intended to be synonymous.
- (c) The Contractor is entitled to advisory options as to the specific application of this policy from the designated representative of the City's Director of Community

Development. The Contractor is entitled to rely on such advice only to the extent of the completeness and accuracy of the facts presented by the Contractor who is requesting such advice. The City expressly disclaims any responsibility for the Contractor's reliance on advice which later proves erroneous or inapplicable because of facts not known to the City's representative who gave the advice.

- (d) The Contractor is cautioned that restrictions in deeds, leases, collective bargaining agreements, and other contracts may not in every case justify an otherwise discriminatory act, policy, or practice. The Contractor must, at his own risk and expense, comply with this policy regardless of contractual restrictions which do not justify Contractor's acts, policies, or practices.

#### 7. Advertising and Promotional Material.

- (a) In all advertising, postings, and promotional material relating to hiring, the Contractor shall include the following statement:

(Name of Contractor) is an equal opportunity employer, and does not discriminate in hiring, promotion, layoff, discipline, transfer, compensation, or other terms of employment because of a person's race, sex, age, handicap, religion, ethnic background, or national origin.

**EXCEPTION:** In "Classified" advertising the Contractor need only include the statement "an equal opportunity employer."

- (b) In all advertising, postings, and promotional material relating to housing, and to programs and services funded in whole or in part under a contract with the City of Salem, the Contractor shall include the following statement:

This (housing, program, or service as applicable) is open to all persons without regard to race, sex, age, handicap, religion, ethnic background or national origin. For further information about this equal opportunity policy, contact (name of Contractor's representative) at (phone number).

#### 8. Retaliation.

The Contractor shall not, in any manner, accord different or unequal treatment to or in any way discriminate against any person because of such person's filing of or participation in any grievance or complaint of discrimination contrary to its policy, whether such grievance or complaint is logged with the City of Salem, or any state or federal court or agency.

#### 9. Grievance Procedure.

During the term of this Contract, and for at least six months thereafter, the Contractor shall conspicuously display the attached "Notice: Your Rights to Have Discrimination Complaints Heard" in locations accessible to the public at its principal office and all other premises

within the City of Salem where it conducts any operations. Likewise the Contractor shall fully cooperate with designated representatives of the City of Salem, and state and federal civil rights compliance agencies in investigating, mediating, and otherwise handling complaints or grievances concerning this Policy.

10. Violations.

Violation by the Contractor of any provision of this Policy may, in addition to any remedy accorded an aggrieved person, be cause for termination of the Contract, debarment from participation in future City of Salem contracts, or both.

11. Contracts Directly Funded by Federal or State Agencies.

If this Contract is funded in whole or in part by federal or state grants, there may be imposed on the Contractor the additional obligation of "affirmative action" to insure equal opportunity, and specific standards and reporting requirements to be met. "Affirmative action", in general, means taking positive and affirmative steps to involve historically disadvantaged classes of persons in the performance of the work or participation in the benefits of this Contract. These steps may include special recruitment efforts, specific goals as to percentages of such persons employed in certain jobs, specific standards for the amount of work to be subcontracted to minority-owned businesses, etc.

If there are such additional requirements beyond this Policy, the Invitation to Bidders or Request for Proposals will state, "This project is funded in whole or in part through (name of agency). Special equal opportunity requirements imposed by that agency are contained in the bid documents, and bidders are cautioned to examine them carefully in preparing their bid."

## **NOTICE:**

### **YOUR RIGHTS TO HAVE DISCRIMINATION COMPLAINTS HEARD**

This organization receives funding or contract payments from the City of Salem. Some or all of those funds may originate with one or more federal or state agency. Organizations receiving grants or contracts from the City of Salem are obligated to accord equal opportunity in employment, and in access to programs and services without regard to a person's race, sex, age, religion, handicap, ethnic background, or national origin.

If you believe that this organization has discriminated against you in violation of that obligation, you have a right to complain without fear of retaliation. The City of Salem has a process for investigating and acting on your complaint. In addition, there may be federal or state courts or agencies that have a process for responding to your complaint.

The duty not to discriminate is clear, but the various agencies that have discrimination complaint procedures each have special rules.

To assist you in the filing of a complaint with the proper agency, you should contact the City of Salem Human Rights and Relations Commission Staff at (503) 588-6261, or visit or write to:

City of Salem Human Rights & Relations Advisory Commission Staff,  
Room 300, City Hall  
555 Liberty Street SE  
Salem, Oregon 97301-3503

# SUBMITTAL REQUIREMENTS

## BID BOND

*KNOW ALL MEN BY THESE PRESENTS, THAT* \_\_\_\_\_

\_\_\_\_\_, hereinafter called the Principal, and  
\_\_\_\_\_, a Corporation duly organized under the  
laws of the State of \_\_\_\_\_, having its principal place of business at  
\_\_\_\_\_, in the State of \_\_\_\_\_,  
and authorized to do business in the State of Oregon, as Surety, are held and firmly bound unto the  
\_\_\_\_\_ in the penal sum of  
\_\_\_\_\_ Dollars, (\$\_\_\_\_\_),  
for payment of which, well and truly to be made, we bind ourselves, our heirs, executors,  
administrators, successors and assigns, jointly and severally, firmly by these presents.

The condition of this Bond is such that, whereas, the Principal herein is herewith submitting  
his or its Bid Proposal for

\_\_\_\_\_

\_\_\_\_\_

said Bid Proposal, by reference thereto, being hereby made a part hereof.

*NOW, THEREFORE*, if the said Bid Proposal submitted by the said Principal be accepted,  
and the Contract be awarded to said Principal, and the said Principal shall execute the proposed  
Contract and shall furnish the Performance Bond as required by the Bidding and Contract  
Documents within the time fixed by said Documents, then this obligation shall be void, otherwise  
to remain in full force and effect.

\_\_\_\_\_

Surety

\_\_\_\_\_

Principal

By: \_\_\_\_\_  
Attorney-in-Fact

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

(Attach copy of Power of Attorney)

10/01

FOR: SOUTHAIR APARTMENTS MODERNIZATION PROJECT  
FOR THE HOUSING AUTHORITY  
OF THE CITY OF SALEM

BID NO. 134046  
CLOSING/ OPENING:  
2:30 p.m.

### BID FORM

1. The undersigned, having familiarized themselves with the local conditions affecting the cost of the work, and with the Specifications (including the Invitation for Bids, Instructions to Bidders, this Bid Form, the form of Bid Bond, the form of Non-Collusive Affidavit, the form of Contract, and the form of Performance and Payment Bond or Bonds, the General Conditions, the Special Conditions, the General Scope of Work, the Technical Conditions, the Special Conditions, the General Scope of Work, the Technical Specifications and the Drawings) and any Addenda, issued thereto, hereby proposes to furnish all labor, materials, equipment and services required to construct and complete all work required for the , in accordance therewith,

Base Bid	Total
Base Bid cost for <u>Stairway replacement &amp; Limited concrete work</u> <u>Roof replacement at three (3) sites</u>	\$

Additive  
DEDUCTIVE ALTERNATES: *attached*

#### Additive Alternates-

Alternate #1- Remove and replace deteriorating concrete sidewalks as shown on Site Plan BA.1

Alternate #2- Paint entire building exteriors of all residential buildings on site (except community room/daycare center building and storage shed.) Base bid includes only painting as necessary for installation of new stairways. *(See Site Plan BA.2)*

List the Sub-Contractors to be employed on this project:

NAME OF FIRM	ADDRESS	TYPE OF WORK TO BE DONE ON THIS PROJECT

**Oregon Business Registration:** To transact business in the State of Oregon a bidder must be registered with the State of Oregon Corporations Division. Please indicate your business's current registration type: [ ] Corporate Registration [ ] Assumed Business Name Registration

**In compliance with ORS 279C.375(2),** no bid for a construction contract shall be received or considered by the public contracting agency unless the bidder is registered with the Construction Contractors Board or licensed by the State Landscape Contractors Board:

BIDDER'S REGISTRATION/LICENSE NO: \_\_\_\_\_

**FOR CITY USE:**

Verified by: \_\_\_\_\_ Date: \_\_\_\_\_

Bidder's Tax Identification Number(s):\_\_\_\_\_

**In compliance with ORS 279C.860,** no bid for a construction contract shall be considered by the public contracting agency if Bidder is on the ineligible list maintained by BOLI.

**FOR CITY USE:**

Verified by: \_\_\_\_\_ Date: \_\_\_\_\_

Any brochures, terms & conditions, contracts or other documents supplied by bidder as part of their proposal shall not vary the terms, conditions, specifications or contracts in City's bid document and bidder agrees that all of City's terms, conditions, specifications, and contracts in City's bid documents shall apply notwithstanding anything to the contrary in any brochure, terms & conditions, contracts, or other documents supplied by bidder as part of their proposal.

**THE UNDERSIGNED ATTESTS** that he has access to the City of Salem Standard Construction Specifications, has reviewed the Specifications in the preparation of this bid, and will abide by all the provisions of the Specifications if this bid is accepted.

**THE UNDERSIGNED FURTHER ATTESTS** that he has carefully considered the addenda

or addenda numbered: \_\_, \_\_, \_\_, \_\_, and \_\_ in the preparation of this bid proposal and such addendum or addenda is/are incorporated herein by this reference in it's/ their entirety and made a part of this bid proposal.

**THE UNDERSIGNED FURTHER ATTESTS** that a drug testing program is in place.

Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

**Name of Business and Official Address**

*Business Name*

*Signature*

*Date*

*Mailing Address*

*(Print or Type Signature Name)*

*City*

*State*

*Zip Code*

*Telephone Number*

*Fax Number*

FEDERAL  
REQUIREMENTS

## NON-COLLUSIVE AFFIDAVIT

STATE OF \_\_\_\_\_ )  
                    ) ss.  
COUNTY OF \_\_\_\_\_ )

\_\_\_\_\_, being first duly sworn,  
deposes and says:

That he is \_\_\_\_\_,  
*(individual, partner, or officer of the firm of etc.)*

the party making the foregoing proposal or bid, that such proposal or bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person to put in a sham bid or to refrain from bidding; and has not, in any manner, directly or indirectly, sought by agreement or collusion, or communication of conference, with any person, to fix the bid price of affiant or any other bidder, or to fix any overhead, profit or cost element of said bid price, or of that or any other bidder, or to secure any advantage against the Owner or any person interested in the proposed contract; and that all statements in said proposal or bid are true.

\_\_\_\_\_

By: \_\_\_\_\_

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

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,  
at \_\_\_\_\_, Oregon.

\_\_\_\_\_

Notary Public for State of Oregon

My commission expires \_\_\_\_\_, 20\_\_\_\_.

CERTIFICATION FOR CONTRACTS, GRANTS, LOANS AND  
COOPERATIVE AGREEMENTS

THE UNDERSIGNED certifies, to the best of his or her knowledge and belief, that:

- 1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

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

By: \_\_\_\_\_  
*(Signature of Authorized Official)*

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

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

# Monthly Employment Utilization Report

**U.S. Department of Labor**

Employment Standards Administration - Office of Federal Contract Compliance Programs

This report is required by Executive Order 11245, Sec. 203. Failure to report can result in contracts being cancelled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts of federally assisted construction contracts.

3. Current Goals Minority	4. Reporting Period From 5/1/2006	Name and Location of Contractor ABC Contractors 210 Lakeview Road Sometown, IL 99999	1. Covered Area (SMSA or EA) This is the covered area	2. Employers I.D. No. 55-5555555	OMB No. 1215-01633
Federal Funding Agency this is the funding agency.					

CONSTRUCTION TRADE	Classifications	6. TOTAL FEDERAL & NON-FEDERAL CONSTRUCTION WORK HOURS										9. Total Number of Employees	10. Total Number of Minority Employees	
		6a. Total All Employees By Trade		6b. Black (Not of Hispanic Origin)		6c. Hispanic		6d. Asian or Pacific Islander		6e. American Indian or Native American				
M	F	M	F	M	F	M	F	M	F	Minority Percentage	Female Percentage	M	F	
Laborer	Journey Worker	40	115	0	0	0	0	0	0	0	0.00%	74.19%	1	1
	Apprentice	0	0	0	0	0	0	0	0	0	0.00%	0	0	0
	Trainee	0	0	0	0	0	0	0	0	0	0.00%	0	0	0
Sub-Total		155	0	0	0	0	0	0	0	0	0.00%	2	2	0
Pipe Fitter	Journey Worker	145	80	145	0	0	0	0	0	0	0.00%	2	1	2
	Apprentice	0	0	0	0	0	0	0	0	0	0.00%	0	0	0
	Trainee	0	0	0	0	0	0	0	0	0	0.00%	0	0	0
Sub-Total		225	145	0	0	0	0	0	0	0.00%	3	2		
Sheetmetal Worker	Journey Worker	147	0	147	0	0	0	0	0	0	0.00%	2	0	2
	Apprentice	0	0	0	0	0	0	0	0	0	0.00%	0	0	0
	Trainee	0	0	0	0	0	0	0	0	0	0.00%	0	0	0
Sub-Total		147	147	0	0	0	0	0	0	0.00%	2	2	2	
Truck Driver	Journey Worker	167	0	40	0	0	0	0	0	0	0.00%	2	0	1
	Apprentice	0	0	0	0	0	0	0	0	0	0.00%	0	0	0
	Trainee	0	0	0	0	0	0	0	0	0	23.95%	0	0	0
Sub-Total		167	40	0	0	0	0	0	0	0.00%	2	1		
Apprentice	Journey Worker													
	Trainee													
	Sub-Total													
Total Journey Worker		499	195	332	0	0	0	0	0	0	3	1	2	0
Total Apprentice		0	0	0	0	0	0	0	0	0	0	0	0	0
Total Trainee		0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total		694	332	0	0	0	0	0	0	0.00%	4	2		
11. Company Official's Signature and Title														
12. Telephone Number (Include area code)														
(555) 555-5555														
13. Date Signed														
Page 1 of 1														

Date \_\_\_\_\_

I,

(Name of Signatory Party)

(Title)

do hereby state:

- (1) That I pay or supervise the payment of the persons employed by

(Contractor or Subcontractor)

on the

(Building or Work)

; that during the payroll period commencing on the

\_\_\_\_\_ day of \_\_\_\_\_, and ending the \_\_\_\_\_ day of \_\_\_\_\_, all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

(Contractor or Subcontractor)

from the full

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below.

## (c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

- Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

## (b) WHERE FRINGE BENEFITS ARE PAID IN CASH

REMARKS:	NAME AND TITLE	SIGNATURE
<input checked="" type="checkbox"/> — in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefit as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.	THE WILFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.	

## (4) That:

## (a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS



- (2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.
- (3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

# INSTRUCTIONS FOR FILING EMPLOYER INFORMATION REPORT EEO-1

## Background

Under Executive Order 11246, contractors and subcontractors participation in federally-assisted construction projects under HUD programs in Region X are required to submit monthly EEO-1 Information Reports. This report is due by the 20th of each month and must identify the contractor's total number of employees with a breakdown of the ethnic minority composition of persons employed by the contractor.

Effective with the reports due on and after May 20, 1972, all contractors and subcontractors who are required to submit written Affirmative Action Programs shall submit monthly reports on Standard Form 100 (attached) covering information as provided by the form, and showing employment data for the 30-day calendar period immediately preceding the 20th of each month.

## Instructions for Completion of Standard Form 100, EEO-1

Standard Form 100, EEO-1, is used primarily by employers covered by the annual reporting requirements of the Joint Reporting Committee (EEOC-OFCC). The following instructions are to be observed in adaptation of SF-100 for use by construction contractors covered by requirements set forth herein:

### Section A - Type of Report

1. Check "Single-establishment Employer Report," if you are engaged in only one federally-assisted project or "Multi-establishment Employer" if you are engaged in more than one federally-assisted project.
2. Indicate the "Total number of reports being filed by this Company."
3. File one EEO-1 report for each federally-assisted construction project.

### Section B -Company Identification

1. Enter your company name together with complete address and Employer Identification Number (nine digit number assigned by Internal Revenue).
2. Establishment for which this report is filed, for this reporting purpose, means the HUD Project involved.
  - a. Name of establishment - indicate Name of HUD Project including Address of Construction site.
  - b. Enter here HUD Identification Number of the Project, as assigned rather than Employer Identification Number (example 127-35211).
3. Parent of Affiliated Company. Complete this subsection if construction contractor or subcontractor is affiliated with a parent company.

### Section C - Employers who are required to file

1. If questions number 1 or 2 are answered "Yes", your company may be covered by the annual joint Reporting Committee requirements. Specific information on this matter may be obtained by contacting the Equal Employment Commission or the Office of Federal Contract Compliance.
2. If you have a prime contract or a subcontract under a HUD assisted construction project, you will answer question number 3 "Yes" and complete Section D- Employment Data.

### Section D - Employment Data

1. Column 1 should include total employment, not just minority employment, including permanent, temporary, and part-time employees, who are employed on the project during the reporting period. Report the total employment and list the number employed in each of the nine occupational groups specified.
2. Enter total male employment and list the number employed in each of the nine occupational groups specified.
3. Enter total female employment and list the number employed in each of the nine occupational groups specified.
4. Report separate employment by race and job assignment for each of the four minority groups (columns 4 - 7): Negro, Oriental, American Indian and Spanish Surnamed American. In Alaska, include Eskimos and Aleuts in the American Indian column. Apprentices and other on-the-job trainees should be included in each occupational category, where appropriate, and should also be reported separately in the space provided at the bottom of the chart.
5. Enter report of female employment in columns 8 - 11 by race and occupation.

### Section E - Establishment Information

1. Answer all questions by checking the appropriate box.
2. Answer all questions by checking the appropriate box.
3. Report the major activity of the contractor or subcontractor such as the general or specialty contractor.

Section F - Remarks Identify all trades utilized at the construction site covered by the reports.

Section G - Certification This section must be completed and signed as indicated. The "name of the person to contact regarding this report" as requested, should be the Contractor's designated Equal Employment Opportunity Officer.

Joint Reporting  
Committee

- Equal Employment Opportunity Commission
- Office of Federal Contract Compliance Programs (Labor)

# EQUAL EMPLOYMENT OPPORTUNITY EMPLOYER INFORMATION REPORT EEO-1

Standard Form 100  
(Rev. 5-84)  
O.M.B No. 3046-0007  
EXPIRES 5-31-86  
100-212

## Section A—TYPE OF REPORT

Refer to instructions for number and types of reports to be filed.

1. Indicate by marking in the appropriate box the type of reporting unit for which this copy of the form is submitted (MARK ONLY ONE BOX).

(1)  Single-establishment Employer Report

Multi-establishment Employer:

- (2)  Consolidated Report (Required)
- (3)  Headquarters Unit Report (Required)
- (4)  Individual Establishment Report (submit one for each establishment with 50 or more employees)
- (5)  Special Report

2. Total number of reports being filed by this Company (Answer on Consolidated Report only)

## Section B—COMPANY IDENTIFICATION (To be answered by all employers)

OFFICE  
USE  
ONLY

1. Parent Company:

a. Name of parent company (owns or controls establishment in item 2) omit if same as label

a.

Name of receiving office | Address (Number and street)

b.

City or town | County | State | ZIP code | b. Employer Identification No.

OFFICE  
USE  
ONLY

2. Establishment for which this report is filed. (Omit if same as label)

a. Name of establishment

c.

Address (Number and street) | City or Town | County | State | ZIP code

d.

b. Employer Identification No. | (Omit if same as label)

e.

## Section C—EMPLOYERS WHO ARE REQUIRED TO FILE (To be answered by all employers)

Yes  No 1. Does the entire company have at least 100 employees in the payroll period for which you are reporting?

Yes  No 2. Is your company affiliated through common ownership and/or centralized management with other entities in an enterprise with a total employment of 100 or more?

Yes  No 3. Does the company or any of its establishments (a) have 50 or more employees AND (b) is not exempt as provided by 41 CFR 60-1.5, AND either (1) is a prime government contractor or first-tier subcontractor, and has a contract, subcontract, or purchase order amounting to \$50,000 or more, or (2) serves as a depository of Government funds in any amount or is a financial institution which is an issuing and paying agent for U.S. Savings Bonds and Savings Notes?

If the response to question C-3 is yes, please enter your Dun and Bradstreet identification number (if you have one): | | | | | | | |

Yes  No 4. Does the company receive financial assistance from the Small Business Administration (SBA)?

NOTE: If the answer is yes to questions 1, 2, or 3, complete the entire form, otherwise skip to Section G.

## Section D—EMPLOYMENT DATA

Employment at this establishment—Report all permanent full-time or part-time employees including apprentices and on-the-job trainees unless specifically excluded as set forth in the instructions. Enter the appropriate figures on all lines and in all columns. Blank spaces will be considered as zeros.

JOB CATEGORIES	OVERALL TOTALS (SUM OF COL. B THRU K)	NUMBER OF EMPLOYEES									
		MALE					FEMALE				
		WHITE (NOT OF HISPANIC ORIGIN)	BLACK (NOT OF HISPANIC ORIGIN)	HISPANIC	ASIAN OR PACIFIC ISLANDER	AMERICAN INDIAN OR ALASKAN NATIVE	WHITE (NOT OF HISPANIC ORIGIN)	BLACK (NOT OF HISPANIC ORIGIN)	HISPANIC	ASIAN OR PACIFIC ISLANDER	AMERICAN INDIAN OR ALASKAN NATIVE
Officials and Managers	1										
Professionals	2										
Technicians	3										
Sales Workers	4										
Office and Clerical	5										
Craft Workers (Skilled)	6										
Operatives (Semi-Skilled)	7										
Laborers (Unskilled)	8										
Service Workers	9										
<b>TOTAL</b>	<b>10</b>										
Total employment reported in previous EEO-1 report	11										

(The trainees below should also be included in the figures for the appropriate occupational categories above)

Formal White collar 12  
On-the-job trainees Production 13

NOTE: Omit questions 1 and 2 on the Consolidated Report.

1. Date(s) of payroll period used:      2. Does this establishment employ apprentices?  
 Yes     No

## Section E—ESTABLISHMENT INFORMATION (Omit on the Consolidated Report)

- |                                                                                                                                                                                                                                                                                                       |           |                                                                                                                                                                                                  |           |                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------|
| 1 <input type="checkbox"/> Yes    2 <input type="checkbox"/> No    3 <input type="checkbox"/> last year                                                                                                                                                                                               | No report | 2: Is the major business activity at this establishment the same as that reported last year?<br><input type="checkbox"/> Yes <input type="checkbox"/> No    3 <input type="checkbox"/> last year | No report | OFFICE USE ONLY |
| 3. What is the major activity of this establishment? (Be specific, i.e., manufacturing steel castings, retail grocer, wholesale plumbing supplies, title insurance, etc. Include the specific type of product or type of service provided, as well as the principal business or industrial activity.) |           |                                                                                                                                                                                                  |           |                 |

## Section F—REMARKS

Use this item to give any identification data appearing on last report which differs from that given above, explain major changes in composition or reporting units and other pertinent information.

## Section G—CERTIFICATION (See Instructions G)

- Check    1  All reports are accurate and were prepared in accordance with the instructions (check on consolidated only)  
 one    2  This report is accurate and was prepared in accordance with the instructions.

Name of Certifying Official      Title      Signature      Date

Name of person to contact regarding this report (Type or print)      Address (Number and street)

Title:	City and State	ZIP code	Telephone Area Code	Number	Extension
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## EQUAL EMPLOYMENT OPPORTUNITY INFORMATION REPORT EEO-1

### Background

Under Executive Order 11246, contractors and subcontractors participation in federally-assisted construction projects under HUD programs in Region X are required to submit monthly EEO-1 Information Reports. This report is due by the 20<sup>th</sup> of each month and must identify the contractor's total number of employees with a breakdown of the ethnic minority composition of persons employed by the contractor.

Effective with the reports due on and after May 20, 1972, all contractors and subcontractors who are required to submit written Affirmative Action Programs shall submit monthly reports on Standard Form 100 (attached) covering information as provided by the form, and showing employment data for the 30-day calendar period immediately preceding the 20<sup>th</sup> of each month.

### Instructions for Completion of Standard Form 100, EEO-1

Standard Form 100, EEO-1, is used primarily by employers covered by the annual reporting requirements of the Joint Reporting Committee (EEOC-OFCC). The following instructions are to be observed in adaptation of SF-100 for use by construction contractors covered by requirements set forth herein:

#### Section A – Type of Report

1. Check "Single-establishment Employer Report," if you are engaged in only one federally-assisted project or "Multi-establishment Employer" if you are engaged in more than one federally-assisted project.
2. Indicate the "Total number of reports being filed by this Company."
3. File one EEO-1 report for each federally-assisted construction project.

#### Section B – Company Identification

1. Enter your company name together with complete address and Employer Identification Number (nine digit number assigned by Internal Revenue).
2. Establishment for which this report is filed, for this reporting purpose, means the HUD Project involved.
  - a. Name of establishment – indicate Name of HUD Project including Address of Construction site.
  - b. Enter here HUD Identification Number of the Project, as assigned rather than Employer Identification Number (example 127-35211).
3. Parent of Affiliated Company. Complete this subsection if construction contractor or subcontractor is affiliated with a parent company.

### Section C – Employers who are required to file

1. If questions number 1 or 2 are answered "Yes", your company may be covered by the annual joint Reporting Committee requirements. Specific information on this matter may be obtained by contacting the Equal Employment Commission or the Office of Federal Contract Compliance.
2. If you have a prime contract or a subcontract under a HUD assisted construction project, you will answer questions number 3 "Yes" and complete Section D – Employment Data.

### Section D – Employment Data

1. Column 1 should include total employment, not just minority employment, including permanent, temporary, and part-time employees, who are employed on the project during the reporting period. Report the total employment and list the number of employed in each of the nine occupational groups specified.
2. Enter total male employment and list the number employed in each of the nine occupational groups specified.
3. Enter total female employment and list the number of employed in each of the nine occupational groups specified.
4. Report separate employment by race and job assignment for each of the four minority groups (columns 4 – 7): Negro, Oriental, American Indian and Spanish Surnamed American. In Alaska, include Eskimos and Aleuts in the American Indian column. Apprentices and other on-the-job trainees should be included in each occupational category, where appropriate, and should also be reported separately in the space provided at the bottom of the chart.
5. Enter report of female employment in columns 8 – 11 by race and occupation.

### Section E – Establishment Information

1. Answer all questions by checking the appropriate box.
2. Answer all questions by checking the appropriate box.
3. Report the major activity of the contractor or subcontractor such as the general or specialty contractor.

Section F – Remarks Identify all trades utilized at the construction site covered by the reports.

Section G – Certification This section must be completed and signed as indicated. The "name of the person to contact regarding this report" as requested, should be the Contractor's designated Equal Employment Opportunity Officer.

United States Department of Labor  
Office of Federal Contract Compliance Programs  
Office of Federal Contract Compliance Programs (OFCCP)

**Executive Order 11246, As Amended**

— DISCLAIMER —

**Executive Order 11246 — Equal Employment Opportunity**

SOURCE: The provisions of Executive Order 11246 of Sept. 24, 1965, appear at 30 FR 12319, 12935, 3 CFR, 1964-1965 Comp., p.339, unless otherwise noted.

Under and by virtue of the authority vested in me as President of the United States by the Constitution and statutes of the United States, it is ordered as follows:

**Part I — Nondiscrimination in Government Employment**

[Part I superseded by EO 11478 of Aug. 8, 1969, 34 FR 12985, 3 CFR, 1966-1970 Comp., p. 803]

**Part II - Nondiscrimination in Employment by Government Contractors and Subcontractors**

**Subpart A - Duties of the Secretary of Labor**

**SEC. 201.** The Secretary of Labor shall be responsible for the administration and enforcement of Parts II and III of this Order. The Secretary shall adopt such rules and regulations and issue such orders as are deemed necessary and appropriate to achieve the purposes of Parts II and III of this Order.

[Sec. 201 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

**Subpart B - Contractors' Agreements**

**SEC. 202.** Except in contracts exempted in accordance with Section 204 of this Order, all Government contracting agencies shall include in every Government contract hereafter entered into the following provisions:

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.
2. The contractor will, in all solicitations or advancements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

3. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
4. The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
5. The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
6. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept. 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
7. The contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States." [Sec. 202 amended by EO 11375 of Oct. 13, 1967, 32 FR 14303, 3 CFR, 1966-1970 Comp., p. 684, EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

**SEC. 203.**

- a. Each contractor having a contract containing the provisions prescribed in Section 202 shall file, and shall cause each of his subcontractors to file, Compliance Reports with the contracting agency or the Secretary of Labor as may be directed. Compliance Reports shall be filed within such times and shall contain such information as to the practices, policies, programs, and employment policies, programs, and employment statistics of the contractor and each subcontractor, and shall be in such form, as the Secretary of Labor may prescribe.
- b. Bidders or prospective contractors or subcontractors may be required to state whether they have participated in any previous contract subject to the provisions of this Order, or any preceding similar Executive order, and in that event to submit, on behalf of themselves and their proposed subcontractors, Compliance Reports prior to or as an initial part of their bid or negotiation of a contract.
- c. Whenever the contractor or subcontractor has a collective bargaining agreement or other contract or understanding with a labor union or an agency referring workers or providing or supervising apprenticeship or training for such workers, the Compliance Report shall include such information as to such labor union's or agency's practices and policies affecting compliance as the Secretary of Labor may prescribe: Provided, That to the extent such information is within the exclusive possession of a labor union

or an agency referring workers or providing or supervising apprenticeship or training and such labor union or agency shall refuse to furnish such information to the contractor, the contractor shall so certify to the Secretary of Labor as part of its Compliance Report and shall set forth what efforts he has made to obtain such information.

1. The Secretary of Labor may direct that any bidder or prospective contractor or subcontractor shall submit, as part of his Compliance Report, a statement in writing, signed by an authorized officer or agent on behalf of any labor union or any agency referring workers or providing or supervising apprenticeship or other training, with which the bidder or prospective contractor deals, with supporting information, to the effect that the signer's practices and policies do not discriminate on the grounds of race, color, religion, sex or national origin, and that the signer either will affirmatively cooperate in the implementation of the policy and provisions of this Order or that it consents and agrees that recruitment, employment, and the terms and conditions of employment under the proposed contract shall be in accordance with the purposes and provisions of the order. In the event that the union, or the agency shall refuse to execute such a statement, the Compliance Report shall so certify and set forth what efforts have been made to secure such a statement and such additional factual material as the Secretary of Labor may require.

[Sec. 203 amended by EO 11375 of Oct. 13, 1967, 32 FR 14303, 3 CFR, 1966-1970 Comp., p. 684; EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

## SEC. 204

- a. The Secretary of Labor may, when the Secretary deems that special circumstances in the national interest so require, exempt a contracting agency from the requirement of including any or all of the provisions of Section 202 of this **Order** in any specific contract, subcontract, or purchase **order**.
- b. The Secretary of Labor may, by rule or regulation, exempt certain classes of contracts, subcontracts, or purchase orders (1) whenever work is to be or has been performed outside the United States and no recruitment of workers within the limits of the United States is involved; (2) for standard commercial supplies or raw materials; (3) involving less than specified amounts of money or specified numbers of workers; or (4) to the extent that they involve subcontracts below a specified tier.
- c. Section 202 of this **Order** shall not apply to a Government contractor or subcontractor that is a religious corporation, association, educational institution, or society, with respect to the employment of individuals of a particular religion to perform work connected with the carrying on by such corporation, association, educational institution, or society of its activities. Such contractors and subcontractors are not exempted or excused from complying with the other requirements contained in this **Order**.
- d. The Secretary of Labor may also provide, by rule, regulation, or order, for the exemption of facilities of a contractor that are in all respects separate and distinct from activities of the contractor related to the performance of the contract: provided, that such an exemption will not interfere with or impede the effectuation of the purposes of this **Order**: and provided further, that in the absence of such an exemption all facilities shall be covered by the provisions of this **Order**."

[Sec. 204 amended by EO 13279 of Dec. 16, 2002, 67 FR 77141, 3 CFR, 2002 Comp., p. 77141 - 77144]

## Subpart C - Powers and Duties of the Secretary of Labor and the Contracting Agencies

**SEC. 205.** The Secretary of Labor shall be responsible for securing compliance by all Government contractors and subcontractors with this Order and any implementing rules or regulations. All contracting agencies shall comply with the terms of this Order and any implementing rules, regulations, or orders of the Secretary of Labor. Contracting agencies shall cooperate with the Secretary of Labor and shall furnish such information and assistance as the Secretary may require.

[Sec. 205 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

**SEC. 206.**

- a. The Secretary of Labor may investigate the employment practices of any Government contractor or subcontractor to determine whether or not the contractual provisions specified in Section 202 of this Order have been violated. Such investigation shall be conducted in accordance with the procedures established by the Secretary of Labor.
- b. The Secretary of Labor may receive and investigate complaints by employees or prospective employees of a Government contractor or subcontractor which allege discrimination contrary to the contractual provisions specified in Section 202 of this Order.

[Sec. 206 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

**SEC. 207.** The Secretary of Labor shall use his/her best efforts, directly and through interested Federal, State, and local agencies, contractors, and all other available instrumentalities to cause any labor union engaged in work under Government contracts or any agency referring workers or providing or supervising apprenticeship or training for or in the course of such work to cooperate in the implementation of the purposes of this Order. The Secretary of Labor shall, in appropriate cases, notify the Equal Employment Opportunity Commission, the Department of Justice, or other appropriate Federal agencies whenever it has reason to believe that the practices of any such labor organization or agency violate Title VI or Title VII of the Civil Rights Act of 1964 or other provision of Federal law.

[Sec. 207 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

**SEC. 208.**

- a. The Secretary of Labor, or any agency, officer, or employee in the executive branch of the Government designated by rule, regulation, or order of the Secretary, may hold such hearings, public or private, as the Secretary may deem advisable for compliance, enforcement, or educational purposes.
- b. The Secretary of Labor may hold, or cause to be held, hearings in accordance with Subsection of this Section prior to imposing, ordering, or recommending the imposition of penalties and sanctions under this Order. No order for debarment of any contractor from further Government contracts under Section 209(6) shall be made without affording the contractor an opportunity for a hearing.

**Subpart D - Sanctions and Penalties**

**SEC. 209.** In accordance with such rules, regulations, or orders as the Secretary of Labor may issue or adopt, the Secretary may:

1. Publish, or cause to be published, the names of contractors or unions which it has concluded have complied or have failed to comply with the provisions of this Order or of the rules, regulations, and orders of the Secretary of Labor.

2. Recommend to the Department of Justice that, in cases in which there is substantial or material violation or the threat of substantial or material violation of the contractual provisions set forth in Section 202 of this Order, appropriate proceedings be brought to enforce those provisions, including the enjoining, within the limitations of applicable law, of organizations, individuals, or groups who prevent directly or indirectly, or seek to prevent directly or indirectly, compliance with the provisions of this Order.
3. Recommend to the Equal Employment Opportunity Commission or the Department of Justice that appropriate proceedings be instituted under Title VII of the Civil Rights Act of 1964.
4. Recommend to the Department of Justice that criminal proceedings be brought for the furnishing of false information to any contracting agency or to the Secretary of Labor as the case may be.
5. After consulting with the contracting agency, direct the contracting agency to cancel, terminate, suspend, or cause to be cancelled, terminated, or suspended, any contract, or any portion or portions thereof, for failure of the contractor or subcontractor to comply with equal employment opportunity provisions of the contract. Contracts may be cancelled, terminated, or suspended absolutely or continuance of contracts may be conditioned upon a program for future compliance approved by the Secretary of Labor.
5. Provide that any contracting agency shall refrain from entering into further contracts, or extensions or other modifications of existing contracts, with any noncomplying contractor, until such contractor has satisfied the Secretary of Labor that such contractor has established and will carry out personnel and employment policies in compliance with the provisions of this Order.

(b) Pursuant to rules and regulations prescribed by the Secretary of Labor, the Secretary shall make reasonable efforts, within a reasonable time limitation, to secure compliance with the contract provisions of this Order by methods of conference, conciliation, mediation, and persuasion before proceedings shall be instituted under subsection (a)(2) of this Section, or before a contract shall be cancelled or terminated in whole or in part under subsection (a)(5) of this Section.

[Sec. 209 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

**SEC. 210.** Whenever the Secretary of Labor makes a determination under Section 209, the Secretary shall promptly notify the appropriate agency. The agency shall take the action directed by the Secretary and shall report the results of the action it has taken to the Secretary of Labor within such time as the Secretary shall specify. If the contracting agency fails to take the action directed within thirty days, the Secretary may take the action directly.

[Sec. 210 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p 230]

**SEC. 211.** If the Secretary shall so direct, contracting agencies shall not enter into contracts with any bidder or prospective contractor unless the bidder or prospective contractor has satisfactorily complied with the provisions of this Order or submits a program for compliance acceptable to the Secretary of Labor.

[Sec. 211 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

**SEC. 212.** When a contract has been cancelled or terminated under Section 209(a)(5) or a contractor has been debarred from further Government contracts under Section 209(a)(6) of this Order, because of noncompliance with the contract provisions specified in Section 202 of this Order, the Secretary of Labor shall promptly notify the Comptroller General of the United States.

[Sec. 212 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

#### **Subpart E - Certificates of Merit**

**SEC. 213.** The Secretary of Labor may provide for issuance of a United States Government Certificate of Merit to employers or labor unions, or other agencies which are or may hereafter be engaged in work under Government contracts, if the Secretary is satisfied that the personnel and employment practices of the employer, or that the personnel, training, apprenticeship, membership, grievance and representation, upgrading, and other practices and policies of the labor union or other agency conform to the purposes and provisions of this Order.

**SEC. 214.** Any Certificate of Merit may at any time be suspended or revoked by the Secretary of Labor if the holder thereof, in the judgment of the Secretary, has failed to comply with the provisions of this Order.

**SEC. 215.** The Secretary of Labor may provide for the exemption of any employer, labor union, or other agency from any reporting requirements imposed under or pursuant to this Order if such employer, labor union, or other agency has been awarded a Certificate of Merit which has not been suspended or revoked.

### **Part III - Nondiscrimination Provisions in Federally Assisted Construction Contracts**

**SEC. 301.** Each executive department and agency, which administers a program involving Federal financial assistance shall require as a condition for the approval of any grant, contract, loan, insurance, or guarantee thereunder, which may involve a construction contract, that the applicant for Federal assistance undertake and agree to incorporate, or cause to be incorporated, into all construction contracts paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to such grant, contract, loan, insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, the provisions prescribed for Government contracts by Section 202 of this Order or such modification thereof, preserving in substance the contractor's obligations thereunder, as may be approved by the Secretary of Labor, together with such additional provisions as the Secretary deems appropriate to establish and protect the interest of the United States in the enforcement of those obligations. Each such applicant shall also undertake and agree (1) to assist and cooperate actively with the Secretary of Labor in obtaining the compliance of contractors and subcontractors with those contract provisions and with the rules, regulations and relevant orders of the Secretary, (2) to obtain and to furnish to the Secretary of Labor such information as the Secretary may require for the supervision of such compliance, (3) to carry out sanctions and penalties for violation of such obligations imposed upon contractors and subcontractors by the Secretary of Labor pursuant to Part II, Subpart D, of this Order, and (4) to refrain from entering into any contract subject to this Order, or extension or other modification of such a contract with a contractor debarred from Government contracts under Part II, Subpart D, of this Order.

[Sec. 301 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

### **SEC. 302.**

- a. "Construction contract" as used in this Order means any contract for the construction, rehabilitation, alteration, conversion, extension, or repair of buildings, highways, or other improvements to real property.
- b. The provisions of Part II of this Order shall apply to such construction contracts, and for purposes of such application the administering department or agency shall be considered the contracting agency referred to therein.
- c. The term "applicant" as used in this Order means an applicant for Federal assistance or, as determined by agency regulation, other program participant, with respect to whom an application for any grant, contract, loan, insurance, or guarantee is not finally acted upon prior to the effective date of this Part, and it includes such an applicant after he/she becomes a recipient of such Federal assistance.

**SEC. 303.**

3. The Secretary of Labor shall be responsible for obtaining the compliance of such applicants with their undertakings under this Order. Each administering department and agency is directed to cooperate with the Secretary of Labor and to furnish the Secretary such information and assistance as the Secretary may require in the performance of the Secretary's functions under this Order.
5. In the event an applicant fails and refuses to comply with the applicant's undertakings pursuant to this Order, the Secretary of Labor may, after consulting with the administering department or agency, take any or all of the following actions: (1) direct any administering department or agency to cancel, terminate, or suspend in whole or in part the agreement, contract or other arrangement with such applicant with respect to which the failure or refusal occurred; (2) direct any administering department or agency to refrain from extending any further assistance to the applicant under the program with respect to which the failure or refusal occurred until satisfactory assurance of future compliance has been received by the Secretary of Labor from such applicant; and (3) refer the case to the Department of Justice or the Equal Employment Opportunity Commission for appropriate law enforcement or other proceedings.
- c. In no case shall action be taken with respect to an applicant pursuant to clause (1) or (2) of subsection (b) without notice and opportunity for hearing.

[Sec. 303 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

**SEC. 304.** Any executive department or agency which imposes by rule, regulation, or order requirements of nondiscrimination in employment, other than requirements imposed pursuant to this Order, may delegate to the Secretary of Labor by agreement such responsibilities with respect to compliance standards, reports, and procedures as would tend to bring the administration of such requirements into conformity with the administration of requirements imposed under this Order: Provided, That actions to effect compliance by recipients of Federal financial assistance with requirements imposed pursuant to Title VI of the Civil Rights Act of 1964 shall be taken in conformity with the procedures and limitations prescribed in Section 602 thereof and the regulations of the administering department or agency issued thereunder.

**Part IV - Miscellaneous**

**SEC. 401.** The Secretary of Labor may delegate to any officer, agency, or employee in the Executive branch of the Government, any function or duty of the Secretary under Parts II and III of this Order.

[Sec. 401 amended by EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230]

**SEC. 402.** The Secretary of Labor shall provide administrative support for the execution of the program known as the "Plans for Progress."

**SEC. 403.**

3. Executive Orders Nos. 10590 (January 19, 1955), 10722 (August 5, 1957), 10925 (March 6, 1961), 11114 (June 22, 1963), and 11162 (July 28, 1964), are hereby superseded and the President's Committee on Equal Employment Opportunity established by Executive Order No. 10925 is hereby abolished. All records and property in the custody of the Committee shall be transferred to the Office of Personnel Management and the Secretary of Labor, as appropriate.
5. Nothing in this Order shall be deemed to relieve any person of any obligation assumed or imposed under or pursuant to any Executive Order superseded by this Order. All rules, regulations, orders, instructions, designations, and other directives issued by the President's Committee on Equal Employment Opportunity and those issued by the heads of various departments or agencies under or pursuant to any of the

Executive orders superseded by this Order, shall, to the extent that they are not inconsistent with this Order, remain in full force and effect unless and until revoked or superseded by appropriate authority. References in such directives to provisions of the superseded orders shall be deemed to be references to the comparable provisions of this Order.

[Sec. 403 amended by EO 12107 of Dec. 28, 1978, 44 FR 1055, 3 CFR, 1978 Comp., p, 264]

**SEC. 404.** The General Services Administration shall take appropriate action to revise the standard Government contract forms to accord with the provisions of this Order and of the rules and regulations of the Secretary of Labor.

**SEC. 405.** This Order shall become effective thirty days after the date of this Order.

# CONTRACTOR/SUBCONTRACTOR AGREEMENT

(Addendum to Contract between Contractor and Subcontractor)

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

ADDRESS: \_\_\_\_\_

SUBCONTRACTOR: \_\_\_\_\_

PROJECT NAME: \_\_\_\_\_ NUMBER: \_\_\_\_\_

1. The parties, having executed a contract for \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ in consideration to the above identified project, acknowledge and agree that:

- 1.1 The Labor Standards provisions are included in the aforesaid contract;
- 1.2 The applicable Davis-Bacon wage rates are included in the aforesaid contract;
- 1.3 The addendum to contract between Contractor and Subcontractor is part of the Contract;
- 1.4 Correction of any infractions of the aforesaid conditions, including infractions by the subcontractor and any lower tier subcontractors, is a mutual responsibility.

## 2. THE PARTIES CERTIFY THAT:

- 2.1 Neither they nor any firm, partnership or association in which they have substantial interest is designated as an ineligible contractor by the Comptroller General of the United States pursuant of Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5) or pursuant to Section 3(a) of the Davis Bacon Act, as amended (40 U.S.C. 276a-2(a)).
- 2.2 No part of the aforementioned contract has been or will be subcontracted to any subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as an ineligible contractor pursuant to any aforementioned regulatory or statutory provisions.
- 2.3 Contractor and Subcontractor will take all necessary affirmative steps to assure opportunities for Minority Business Enterprises (MBE's) to participate in at least twenty percent (20%) of the contract. MBE's will be solicited whenever they are a potential source.

## 3. THE SUBCONTRACTOR AGREES TO:

- 3.1 Obtain and forward to the aforementioned contractor within ten days after the execution of any subcontract, including those executed by the subcontractors and any lower tier subcontractors, copy of said contract containing fully executed items 1.1, 1.2, and 1.3 listed above.
- 3.2 Supply to the Contractor, prior to commencing work under this contract, copies of insurance certificates of General Liability and Automobile Coverage showing

coverage at the minimum of \$500,000.00 combined single limit, and Workers Compensation insurance equal to that required by Oregon State labor law.

3.3 Not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin; and to take affirmative action to ensure that applicants are employed; and to comply with all provisions of Executive Order 11246 of September 24, 1965 and the rules and relevant orders of the Secretary of Labor.

4. THE SUBCONTRACTOR CERTIFIES THAT:

4.1 The legal name and business address are:

\_\_\_\_\_  
\_\_\_\_\_  
Zip: \_\_\_\_\_

Federal ID # \_\_\_\_\_ Contractor License # \_\_\_\_\_ Tel # \_\_\_\_\_

4.2 The subcontractor is (mark all applicable)

- A single Proprietorship
- A Partnership
- A Corporation Organization and Licensed in the State of \_\_\_\_\_
- Other Organization (describe) \_\_\_\_\_
- A minority Business Enterprise (describe) \_\_\_\_\_

4.3 The name, title, and address of the Owner, Partners or Officers of the Subcontractor are:

Name	Title	Home Address
_____	_____	_____
_____	_____	_____

CONTRACTOR SIGNATURE	SUBCONTRACTOR SIGNATURE
NAME: _____	NAME: _____
TITLE: _____	TITLE: _____
DATE: _____	DATE: _____

### **Contractor/Subcontractor Section 3 Certification and Agreement**

(This Certification to be included in all subcontracts)

Section 3 of the Housing and Urban Development Act of 1968 requires that Housing Authorities, to the greatest extent feasible, direct economic opportunities to "Section 3 businesses" that provide economic opportunities to low-income persons. **Section 3 resident** means (1) a public housing resident; or (2) an individual who lives in the Salem area who is a low income person or family whose income(s) do not exceed 80% of the median income for the area. Income limits as published by HUD 12/4/2012 are as follows:

<u>Family Size</u>	<u>Income limit</u>	<u>Family Size</u>	<u>Income limit</u>
1 Person	\$31,950	5 Person	\$49,250
2 Person	\$36,500	6 Person	\$52,900
3 Person	\$41,050	7 Person	\$56,550
4 Person	\$45,600	8 Person	\$60,200

You are a Section 3 business if you meet any one of the 3 qualifications below. To certify to your Section 3 status, please mark one or more of the 3 categories below and provide the requested information regarding Section 3 recipients.

(Select One)

(1) This business is 51% or more owned by section 3 (low income) residents as defined above.

Name(s) of Section 3 qualified owners: \_\_\_\_\_

(2) OR, at least 30% of our permanent employees are section 3 residents, or they were section 3 residents within three years of the date of first employment with this business.

Name(s) of Section 3 employees: \_\_\_\_\_

(3) OR, this business provides evidence of a commitment to subcontract at least 25% of the dollar amount of all subcontracts to section 3 businesses.

Name(s) of Section 3 Subcontractor(s): \_\_\_\_\_

(4) OR, this is not a qualified Section 3 business.

Contractor/Subcontractor:

\_\_\_\_\_  
Name (print or type)

\_\_\_\_\_  
Company

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Federal ID (or SS) # \_\_\_\_\_ Phone (\_\_\_\_\_) \_\_\_\_\_

*The information below is optional for bidders. It will be required from the successful contractor and all subcontractors.*

Racial/Ethnic Code of Owner:

Caucasian     African American     Native American     Hispanic     Asian/Pacific  
 Hasidic Jew

Woman Owned Business? Yes \_\_\_\_ No \_\_\_\_

Section 1001, Title 18 of the US Code of Federal Regulations makes it a crime to make willful false statements or misrepresentations to any department or agency of the United States on any matter within its jurisdiction.

Revised 12/6/2012 ff

**Low Bid Contract Section 3 Language**  
(See 24 CFR 135.92 Appendix)

Preference in the award of section 3 covered contracts that are awarded under a sealed bid process may be provided as follows:

**Contracts under \$100,000-** Where the section 3 covered contract is to be awarded based upon the lowest price, the contract shall be awarded to the qualified section 3 business concern with the lowest responsive quotation, if it is reasonable and no more than 10 percent higher than the quotation of the lowest responsive quotation from any qualified source. If no responsive quotation by a qualified section 3 business concern is within 10 percent of the lowest responsive quotation from any qualified source, the award shall be made to the source with the lowest quotation.

**Contracts over \$100,000-** Bids shall be solicited from all businesses (section 3 business concerns, and non-section 3 business concerns). An award shall be made to the qualified section 3 business concern with the highest priority ranking and with the lowest responsive bid if that bid—

- (A) is within the maximum total contract price established in the contracting party's budget for the specific project for which bids are being taken, and
- (B) is not more than "X" higher than the total bid price of the lowest responsive bid from any responsible bidder. "X" is determined as follows:

When the lowest responsive bid is:

Less than \$100,000 .....	10% of that bid.
At least \$100,000, but less than \$200,000	9% of that bid.
At least \$200,000, but less than \$300,000	8% of that bid.
At least \$300,000, but less than \$400,000	7% of that bid.
At least \$400,000, but less than \$500,000	6% of that bid.
At least \$500,000, but less than \$1 million	5% of that bid.
At least \$1 million, but less than \$2 million	4% of that bid.
At least \$2 million, but less than \$4 million	3% of that bid.
At least \$4 million, but less than \$7 million	2% of that bid.
\$7 million or more.....	1\1/2% of that bid.

(c) If no responsive bid by a Section 3 business meets the requirements of paragraph (b) above, the contract shall be awarded to the responsible bidder with the lowest responsive bid.

(d) All bidders are advised that the successful bidder must submit a Section 3 strategy describing how the bidder plans to comply with the Section 3 [ ] training and employment preference, or [ ] contracting preference, or [ ] both before award of any contract. The Section 3 strategy shall be submitted within ten (10) days of notification as the successful bidder. Failure to submit an acceptable strategy by the date required shall result in the rejection of the bid.

**CONTRACTOR'S SECTION 3 OPPORTUNITIES PLAN**  
(Section 3 of the Housing Act of 1968, 24 CFR 135.1)

***Business Opportunities and Employment Training for Salem Housing Authority  
Public Housing Residents and Low and Very Low Income Salem-area Residents***

I. Section 3 Opportunities Plan (Contractor must check Option 1, 2 and/or 3)

(Option 1) The Contractor is a Section 3 business. (yes/no) \_\_\_\_\_  
(see *Contractor Certification Form* for qualifications.)

(Option 2) Or the Contractor will subcontract with the following Section 3 business(es) to comply with the Section 3 requirement that at least 10% of the total dollar amount of all section 3 covered contracts be awarded to Section 3 businesses (See *Contractor Certification Form* for qualifications of Section 3 businesses) :

Business Name	Award Amount

(Option 3) The Contractor hereby agrees to comply with all the provisions of Section 3 as set forth in 24 CFR 135.1 et seq. and SHA Resolutions implementing Section 3 requirements. The Contractor hereby submits the following Hiring/Training Plan to identify employment opportunities for the SHA public housing residents and low and very low income area residents, during the term of the contract between the Contractor and SHA. The Contractor affirms that the jobs identified shall be for meaningful employment that may or may not be related to the scope of services covered under this contract. The Contractor has committed to employ and/or train the following in order to comply with the requirement that 10% of the dollar amount of all Section 3 covered contracts be awarded to Section 3 residents or business concerns.

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You may comply by choosing one or all options. Remember 10% of the dollar value of this contract must go to Section 3 residents or businesses, or any remaining percentage (up to 10%) will be deducted from your draw request and placed in the SHA's Family Self-sufficiency account.

The failure of the contractor to comply with the above-approved plan shall be a material breach of the contract.

Contractor's Signature and Title:

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

## II. Hiring/Training Plan:

### III. REPORT OF SECTION 3 HIRES

### SECTION 3 RESIDENT EMPLOYEE INFORMATION

# CODE OF FEDERAL REGULATIONS

e-CFR Data is current as of June 26, 2013

Title 41: Public Contracts and Property Management

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## PART 60-4—CONSTRUCTION CONTRACTORS—AFFIRMATIVE ACTION REQUIREMENTS

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### Contents

- § 60-4.1 Scope and application.
  - § 60-4.2 Solicitations.
  - § 60-4.3 Equal opportunity clauses.
  - § 60-4.4 Affirmative action requirements.
  - § 60-4.5 Hometown plans.
  - § 60-4.6 Goals and timetables.
  - § 60-4.7 Effect on other regulations.
  - § 60-4.8 Show cause notice.
  - § 60-4.9 Incorporation by operation of the order.
- 

### § 60-4.1 Scope and application.

This part applies to all contractors and subcontractors which hold any Federal or federally assisted construction contract in excess of \$10,000. The regulations in this part are applicable to all of a construction contractor's or subcontractor's construction employees who are engaged in on site construction including those construction employees who work on a non-Federal or non-federally assisted construction site. This part also establishes procedures which all Federal contracting officers and all applicants, as applicable, shall follow in soliciting for and awarding Federal or federally assisted construction contracts. Procedures also are established which administering agencies shall follow in making any grant, contract, loan, insurance, or guarantee involving federally assisted construction which is not exempt from the requirements of Executive Order 11246, as amended.

In addition, this part applies to construction work performed by construction contractors and subcontractors for Federal non-construction contractors and subcontractors if the construction work is necessary in whole or in part to the performance of a non-construction contract or subcontract.

[43 FR 49254, Oct. 20, 1978; 43 FR 51401, Nov. 3, 1978]

### § 60-4.2 Solicitations.

(a) All Federal contracting officers and all applicants shall include the notice set forth in paragraph (d) of this section and the Standard Federal Equal Employment Opportunity Construction Contract Specifications set forth in § 60-4.3 of this part in all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts to be performed in geographical areas designated by the Director pursuant to § 60-4.6 of the part. Administering agencies shall require the inclusion of the notice set forth in paragraph (d) of this section and the specifications set forth in § 60-4.3 of this part as a condition of any grant, contract, subcontract, loan, insurance or guarantee involving federally assisted construction covered by this part 60-4.

(b) All non-construction contractors covered by Executive Order 11246 and the implementing regulations shall include the notice in paragraph (d) of this section in all construction agreements which are necessary in whole or in part to the performance of the covered non-construction contract.

(c) Contracting officers, applicants and non-construction contractors shall give written notice to the Director within 10 working days of award of a contract subject to these provisions. The notification shall include the name, address and telephone number of the contractor; employer identification number; dollar amount of the contract, estimated starting and completion dates of the contract; the contract number; and geographical area in which the contract is to be performed.

(d) The following notice shall be included in, and shall be a part of, all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of \$10,000 to be performed in geographical areas designated by the Director pursuant to § 60-4.6 of this part (see 41 CFR 60-4.2(a)):

**NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY  
(EXECUTIVE ORDER 11246)**

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Time-tables	Goals for minority participation for each trade	Goals for female participation in each trade
	Insert goals for each year	Insert goals for each year.

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county and city, if any).

[43 FR 49254, Oct. 20, 1978; 43 FR 51401, Nov. 3, 1978, as amended at 45 FR 65977, Oct. 3, 1980]

**§ 60-4.3 Equal opportunity clauses.**

(a) The equal opportunity clause published at 41 CFR 60-1.4(a) of this chapter is required to be included in, and is part of, all nonexempt Federal contracts and subcontracts, including construction contracts and subcontracts. The equal opportunity clause published at 41 CFR 60-1.4(b) is required to be included in,

and is a part of, all nonexempt federally assisted construction contracts and subcontracts. In addition to the clauses described above, all Federal contracting officers, all applicants and all non-construction contractors, as applicable, shall include the specifications set forth in this section in all Federal and federally assisted construction contracts in excess of \$10,000 to be performed in geographical areas designated by the Director pursuant to § 60-4.6 of this part and in construction subcontracts in excess of \$10,000 necessary in whole or in part to the performance of non-construction Federal contracts and subcontracts covered under the Executive order.

**STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS  
(EXECUTIVE ORDER 11246)**

1. As used in these specifications:

- a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
- b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
- c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
- d. "Minority" includes:
  - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
  - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
  - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
  - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7 a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the **FEDERAL REGISTER** in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal

procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations:

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

(b) The notice set forth in 41 CFR 60-4.2 and the specifications set forth in 41 CFR 60-4.3 replace the New Form for Federal Equal Employment Opportunity Bid Conditions for Federal and Federally Assisted Construction published at 41 FR 32482 and commonly known as the Model Federal EEO Bid Conditions, and the New Form shall not be used after the regulations in 41 CFR part 60-4 become effective.

[43 FR 49254, Oct. 20, 1978; 43 FR 51401, Nov. 3, 1978, as amended at 45 FR 65978, Oct. 3, 1980]

#### **§ 60-4.4 Affirmative action requirements.**

(a) To implement the affirmative action requirements of Executive Order 11246 in the construction industry, the Office of Federal Contract Compliance Programs previously has approved affirmative action programs commonly referred to as "Hometown Plans," has promulgated affirmative action plans referred to as "Imposed Plans" and has approved "Special Bid Conditions" for high impact projects constructed in areas not covered by a Hometown or an Imposed Plan. All solicitations for construction contracts made after the effective date of the regulations in this part shall include the notice specified in § 60-4.2 of this part and the specifications in § 60-4.3 of this part in lieu of the Hometown and Imposed Plans including the Philadelphia Plan and Special Bid Conditions. Until the Director has issued an order pursuant to § 60-4.6 of this part establishing goals and timetables for minorities in the appropriate geographical areas or for a project covered by Special Bid Conditions, the goals and timetables for minorities to be inserted in the Notice required by 41 CFR 60-4.2 shall be the goals and timetables contained in the Hometown Plan, Imposed Plan or Special Bid Conditions presently covering the respective geographical area or project involved.

(b) Signatories to a Hometown Plan (including heavy highway affirmative action plans) shall have 45 days from the effective date of the regulations in this part to submit under such a Plan (for the director's approval) goals and timetables for women and to include female representation on the Hometown Plan Administrative Committee. Such goals for female representation shall be at least as high as the goals established for female representation in the notice issued pursuant to 41 CFR 60-4.6. Failure of the signatories, within the 45-day period, to include female representation and to submit goals for women or a new plan, as appropriate, shall result in an automatic

termination of the Office of Federal Contract Compliance Program's approval of the Hometown Plan. At any time the Office of Federal Contract Compliance Programs terminates or withdraws its approval of a Hometown Plan, or when the plan expires and another plan is not approved, the contractors signatory to the plan shall be covered automatically by the specifications set forth in § 60-4.3 of this part and by the goals and timetables established for that geographical area pursuant to § 60-4.6 of this part.

#### **§ 60-4.5 Hometown plans.**

(a) A contractor participating, either individually or through an association, in an approved Hometown Plan (including heavy highway affirmative action plans) shall comply with its affirmative action obligations under Executive Order 11246 by complying with its obligations under the plan: *Provided*, That each contractor or subcontractor participating in an approved plan is individually required to comply with the equal opportunity clause set forth in 41 CFR 60-1.4; to make a good faith effort to achieve the goals for each trade participating in the plan in which it has employees; and that the overall good performance by other contractors or subcontractors toward a goal in an approved plan does not excuse any covered contractor's or subcontractor's failure to take good faith efforts to achieve the plan's goals and timetables. If a contractor is not participating in an approved Hometown Plan it shall comply with the specifications set forth in § 60-4.3 of this part and with the goals and timetables for the appropriate area as listed in the notice required by 41 CFR 60-4.2 with regard to that trade. For the purposes of this part 60-4, a contractor is not participating in a Hometown Plan for a particular trade if it:

- (1) Ceases to be signatory to a Hometown Plan covering that trade;
  - (2) Is signatory to a Hometown Plan for that trade but is not party to a collective bargaining agreement for that trade;
  - (3) Is signatory to a Hometown Plan for that trade but is party to a collective bargaining agreement with labor organizations which are not or cease to be signatories to the same Hometown Plan for that trade;
  - (4) Is signatory to a Hometown Plan for that trade but is party to a collective bargaining agreement with a labor organization for that trade but the two have not jointly executed a specific commitment to minority and female goals and timetables and incorporated the commitment in the Hometown Plan for that trade;
  - (5) Is participating in a Hometown Plan for that trade which is no longer acceptable to the Office of Federal Contract Compliance Programs;
  - (6) Is signatory to a Hometown Plan for that trade but is party to a collective bargaining agreement with a labor organization for that trade and the labor organization and the contractor have failed to make a good faith effort to comply with their obligations under the Hometown Plan for that trade.
- (b) Contractors participating in Hometown Plans must be able to demonstrate their participation and document their compliance with the provision of the Hometown Plan.

#### **§ 60-4.6 Goals and timetables.**

The Director, from time to time, shall issue goals and timetables for minority and female utilization which shall be based on appropriate workforce, demographic or other relevant data and which shall cover construction projects or construction contracts performed in specific geographical areas. The goals, which shall be applicable to each construction trade in a covered contractor's or subcontractor's entire workforce which is working in the area covered by the goals and timetables, shall be published as notices in the FEDERAL REGISTER, and shall be inserted by the contracting officers and applicants, as applicable, in the Notice required by 41 CFR 60-4.2. Covered construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed.

[45 FR 65978, Oct. 3, 1980]

#### **§ 60-4.7 Effect on other regulations.**

The regulations in this part are in addition to the regulations contained in this chapter which apply to construction contractors and subcontractors generally. See particularly, 41 CFR 60-1.4 (a), (b), (c), (d), and (e); 60-1.5; 60-1.7; 60-1.8; 60-1.26; 60-1.29; 60-1.30; 60-1.32; 60-1.41; 60-1.42; 60-1.43; and 41 CFR part 60-3; part 60-20; part 60-30; part 60-40; and part 60-50.

#### **§ 60-4.8 Show cause notice.**

If an investigation or compliance review reveals that a construction contractor or subcontractor has violated the Executive order, any contract clause, specifications or the regulations in this chapter and if administrative enforcement is contemplated, the Director shall issue to the contractor or subcontractor a notice to show cause which shall contain the items specified in paragraphs (i) through (iv) of 41 CFR 60-2.2(c)(1). If the contractor does not show good cause within 30 days, or in the alternative, fails to enter an acceptable conciliation agreement which includes where appropriate, make up goals and timetables, back pay, and seniority relief for affected class members, the OFCCP shall follow the procedure in 41 CFR 60-1.26(b): *Provided*, That where a conciliation agreement has been violated, no show cause notice is required prior to the initiation of enforcement proceedings.

[43 FR 49254, Oct. 20, 1978; 43 FR 51401, Nov. 3, 1978]

#### **§ 60-4.9 Incorporation by operation of the order.**

By operation of the order, the equal opportunity clause contained in § 60-1.4, the Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246) contained in § 60-4.2, and the Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246) contained in § 60-4.3 shall be deemed to be a part of every solicitation or of every contract and subcontract, as appropriate, required by the order and the regulations in this chapter to include such clauses whether or not they are physically incorporated in such solicitation or contract and whether or not the contract is written.

## **Title 24: Housing and Urban Development**

### **PART 135—ECONOMIC OPPORTUNITIES FOR LOW- AND VERY LOW-INCOME PERSONS**

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**Authority:** 12 U.S.C. 1701u; 42 U.S.C. 3535(d).

**Source:** 59 FR 33880, June 30, 1994, unless otherwise noted.

**Effective Date Note:** At 59 FR 33880, June 30, 1994, part 135 was revised effective August 1, 1994 through June 30, 1995. At 60 FR 28325, May 31, 1995, the effective period was extended until the final rule implementing changes made to section 3 of the Housing and Urban Development Act of 1968 by the Housing and Community Development Act of 1992 is published and becomes effective.

##### **Subpart A—General Provisions**

### **§ 135.1 Purpose.**

(a) *Section 3.* The purpose of section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701u) (section 3) is to ensure that employment and other economic opportunities generated by certain HUD financial assistance shall, to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, be directed to low- and very low-income persons, particularly those who are recipients of government assistance for housing, and to business concerns which provide economic opportunities to low- and very low-income persons.

(b) *Part 135.* The purpose of this part is to establish the standards and procedures to be followed to ensure that the objectives of section 3 are met.

### **§ 135.2 Effective date of regulation.**

The regulations of this part will remain in effect until the date the final rule adopting the regulations of this part with or without changes is published and becomes effective, at which point the final rule will remain in effect.

[60 FR 28326, May 31, 1995]

### **§ 135.3 Applicability.**

(a) *Section 3 covered assistance.* Section 3 applies to the following HUD assistance (section 3 covered assistance):

(1) *Public and Indian housing assistance.* Section 3 applies to training, employment, contracting and other economic opportunities arising from the expenditure of the following public and Indian housing assistance:

(i) Development assistance provided pursuant to section 5 of the U.S. Housing Act of 1937 (1937 Act);

(ii) Operating assistance provided pursuant to section 9 of the 1937 Act; and

(iii) Modernization assistance provided pursuant to section 14 of the 1937 Act;

(2) *Housing and community development assistance.* Section 3 applies to training, employment, contracting and other economic opportunities arising in connection with the expenditure of housing assistance (including section 8 assistance, and including other housing assistance not administered by the Assistant Secretary of Housing) and community development assistance that is used for the following projects;

(i) Housing rehabilitation (including reduction and abatement of lead-based paint hazards, but excluding routine maintenance, repair and replacement);

(ii) Housing construction; and

(iii) Other public construction.

(3) *Thresholds* —(i) *No thresholds for section 3 covered public and Indian housing assistance.* The requirements of this part apply to section 3 covered assistance provided to recipients, notwithstanding the amount of the assistance provided to the recipient. The requirements of this part apply to all contractors and subcontractors performing work in connection with projects and activities funded by public and Indian housing assistance covered by section 3, regardless of the amount of the contract or subcontract.

(ii) *Thresholds for section 3 covered housing and community development assistance* —(A) *Recipient thresholds.* The requirements of this part apply to recipients of other housing and community development program assistance for a section 3 covered project(s) for which the amount of the assistance exceeds \$200,000.

(B) *Contractor and subcontractor thresholds.* The requirements of this part apply to contractors and subcontractors performing work on section 3 covered project(s) for which the amount of the assistance exceeds \$200,000; and the contract or subcontract exceeds \$100,000.

(C) *Threshold met for recipients, but not contractors or subcontractors.* If a recipient receives section 3 covered housing or community development assistance in excess of \$200,000, but no contract exceeds \$100,000, the section 3 preference requirements only apply to the recipient.

(b) *Applicability of section 3 to entire project or activity funded with section 3 assistance.* The requirements of this part apply to the entire project or activity that is funded with section 3 covered assistance, regardless of whether the section 3 activity is fully or partially funded with section 3 covered assistance.

(c) *Applicability to Indian housing authorities and Indian tribes.* Indian housing authorities and tribes that receive HUD assistance described in paragraph (a) of this section shall comply with the procedures and requirements of this part to the maximum extent consistent with, but not in derogation of, compliance with section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e(b)). (See 24 CFR part 905.)

(d) *Other HUD assistance and other Federal assistance.* Recipients, contractors and subcontractors that receive HUD assistance, not listed in paragraph (a) of this section, or other Federal assistance, are encouraged to provide, to the greatest extent feasible, training, employment, and contracting opportunities generated by the expenditure of this assistance to low- and very low-income persons, and business concerns owned by low- and very low-income persons, or which employ low- and very low-income persons.

## § 135.5 Definitions.

The terms *Department*, *HUD*, *Indian housing authority (IHA)*, *Public housing agency (PHA)*, and *Secretary* are defined in 24 CFR part 5.

*Annual Contributions Contract (ACC)* means the contract under the U.S. Housing Act of 1937 (1937 Act) between HUD and the PHA, or between HUD and the IHA, that contains the terms and conditions under which HUD assists the PHA or the IHA in providing decent, safe, and sanitary housing for low income families. The ACC must be in a form prescribed by HUD under which HUD agrees to provide assistance in the development, modernization and/or operation of a low income housing project under the 1937 Act, and the PHA or IHA agrees to develop, modernize and operate the project in compliance with all provisions of the ACC and the 1937 Act, and all HUD regulations and implementing requirements and procedures. (The ACC is not a form of procurement contract.)

*Applicant* means any entity which makes an application for section 3 covered assistance, and includes, but is not limited to, any State, unit of local government, public housing agency, Indian housing authority, Indian tribe, or other public body, public or private nonprofit organization, private agency or institution, mortgagor, developer, limited dividend sponsor, builder, property manager, community housing development organization (CHDO), resident management corporation, resident council, or cooperative association.

*Assistant Secretary* means the Assistant Secretary for Fair Housing and Equal Opportunity.

*Business concern* means a business entity formed in accordance with State law, and which is licensed under State, county or municipal law to engage in the type of business activity for which it was formed.

*Business concern that provides economic opportunities for low- and very low-income persons.* See definition of "section 3 business concern" in this section.

*Contract.* See the definition of "section 3 covered contract" in this section.

*Contractor* means any entity which contracts to perform work generated by the expenditure of section 3 covered assistance, or for work in connection with a section 3 covered project.

*Employment opportunities generated by section 3 covered assistance* means all employment opportunities generated by the expenditure of section 3 covered public and Indian housing assistance (i.e., operating assistance, development assistance and modernization assistance, as described in §135.3(a)(1)). With respect to section 3 covered housing and community development assistance, this term means all employment opportunities arising in connection with section 3 covered projects (as described in §135.3(a)(2)), including management and administrative jobs connected with the section 3 covered project. Management and administrative jobs include architectural, engineering or related professional services required to prepare plans, drawings, specifications, or work write-ups; and jobs directly related to administrative support of these activities, e.g., construction manager, relocation specialist, payroll clerk, etc.

*Housing authority (HA)* means, collectively, public housing agency and Indian housing authority.

*Housing and community development assistance* means any financial assistance provided or otherwise made available through a HUD housing or community development program through any grant, loan, loan guarantee, cooperative agreement, or contract, and includes community development funds in the form of community development block grants, and loans guaranteed under section 108 of the Housing and Community Development Act of 1974, as amended. Housing and community development assistance does not include financial assistance provided through a contract of insurance or guaranty.

*Housing development* means low-income housing owned, developed, or operated by public housing agencies or Indian housing authorities in accordance with HUD's public and Indian housing program regulations codified in 24 CFR Chapter IX.

*HUD Youthbuild programs* mean programs that receive assistance under subtitle D of Title IV of the National Affordable Housing Act, as amended by the Housing and Community Development Act of 1992 (42 U.S.C. 12899), and provide disadvantaged youth with opportunities for employment, education, leadership development, and training in the construction or rehabilitation of housing for homeless individuals and members of low- and very low-income families.

*Indian tribes* shall have the meaning given this term in 24 CFR part 571.

*JTPA* means the Job Training Partnership Act (29 U.S.C. 1579(a)).

*Low-income person.* See the definition of "section 3 resident" in this section.

*Metropolitan area* means a metropolitan statistical area (MSA), as established by the Office of Management and Budget.

*Neighborhood area* means:

(1) For HUD housing programs, a geographical location within the jurisdiction of a unit of general local government (but not the entire jurisdiction) designated in ordinances, or other local documents as a neighborhood, village, or similar geographical designation.

(2) For HUD community development programs, see the definition, if provided, in the regulations for the applicable community development program, or the definition for this term in 24 CFR 570.204(c)(1).

*New hires* mean full-time employees for permanent, temporary or seasonal employment opportunities.

*Norimetropolitan county* means any county outside of a metropolitan area.

*Other HUD programs* means HUD programs, other than HUD public and Indian housing programs, that provide housing and community development assistance for "section 3 covered projects," as defined in this section.

*Public housing resident* has the meaning given this term in 24 CFR part 963.

*Recipient* means any entity which receives section 3 covered assistance, directly from HUD or from another recipient and includes, but is not limited to, any State, unit of local government, PHA, IHA, Indian tribe, or other public body, public or private nonprofit organization, private agency or institution, mortgagor, developer, limited dividend sponsor, builder, property manager, community housing development organization, resident management corporation, resident council, or cooperative association. Recipient also includes any successor, assignee or transferee of any such entity, but does not include any ultimate beneficiary under the HUD program to which section 3 applies and does not include contractors.

*Section 3* means section 3 of the Housing and Urban Development Act of 1968, as amended (12 U.S.C. 1701u).

*Section 3 business concern* means a business concern, as defined in this section—

- (1) That is 51 percent or more owned by section 3 residents; or
- (2) Whose permanent, full-time employees include persons, at least 30 percent of whom are currently section 3 residents, or within three years of the date of first employment with the business concern were section 3 residents; or
- (3) That provides evidence of a commitment to subcontract in excess of 25 percent of the dollar award of all subcontracts to be awarded to business concerns that meet the qualifications set forth in paragraphs (1) or (2) in this definition of "section 3 business concern."

*Section 3 clause* means the contract provisions set forth in §135.38.

*Section 3 covered activity* means any activity which is funded by section 3 covered assistance public and Indian housing assistance.

- Section 3 covered assistance* means:
- (1) Public and Indian housing development assistance provided pursuant to section 5 of the 1937 Act;
  - (2) Public and Indian housing operating assistance provided pursuant to section 9 of the 1937 Act;
  - (3) Public and Indian housing modernization assistance provided pursuant to section 14 of the 1937 Act;
  - (4) Assistance provided under any HUD housing or community development program that is expended for work arising in connection with:
    - (i) Housing rehabilitation (including reduction and abatement of lead-based paint hazards, but excluding routine maintenance, repair and replacement);
    - (ii) Housing construction; or
    - (iii) Other public construction project (which includes other buildings or improvements, regardless of ownership).

*Section 3 covered contract* means a contract or subcontract (including a professional service contract) awarded by a recipient or contractor for work generated by the expenditure of section 3 covered assistance, or for work arising in connection with a section 3 covered project. "Section 3 covered contracts" do not include contracts awarded under HUD's procurement program, which are governed by the Federal Acquisition Regulation System (see 48 CFR, Chapter 1). "Section 3 covered contracts" also do not include contracts for the purchase of supplies and materials. However, whenever a contract for materials includes the installation of the materials, the contract constitutes a section 3 covered contract. For example, a contract for the purchase and installation of a furnace would be a section 3 covered contract because the contract is for work (i.e., the installation of the furnace) and thus is covered by section 3.

*Section 3 covered project* means the construction, reconstruction, conversion or rehabilitation of housing (including reduction and abatement of lead-based paint hazards), other public construction which includes buildings or improvements (regardless of ownership) assisted with housing or community development assistance.

*Section 3 joint venture.* See §135.40. *Section 3 resident* means: (1) A public housing resident; or

(2) An individual who resides in the metropolitan area or nonmetropolitan county in which the section 3 covered assistance is expended, and who is:

(i) *A low-income person*, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act defines this term to mean families (including single persons) whose incomes do not exceed 80 per centum of the median income for the area, as determined by the Secretary, with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 80 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of prevailing levels of construction costs or unusually high or low-income families; or

(ii) *A very low-income person*, as this term is defined in section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)). Section 3(b)(2) of the 1937 Act (42 U.S.C. 1437a(b)(2)) defines this term to mean families (including single persons) whose incomes do not exceed 50 per centum of the median family income for the area, as determined by the Secretary with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 50 per centum of the median for the area on the basis of the Secretary's findings that such variations are necessary because of unusually high or low family incomes.

(3) A person seeking the training and employment preference provided by section 3 bears the responsibility of providing evidence (if requested) that the person is eligible for the preference.

*Section 8 assistance* means assistance provided under section 8 of the 1937 Act (42 U.S.C. 1437f) pursuant to 24 CFR part 882, subpart G.

*Service area* means the geographical area in which the persons benefitting from the section 3 covered project reside. The service area shall not extend beyond the unit of general local government in which the section 3 covered assistance is expended. In HUD's Indian housing programs, the service area, for IHAs established by an Indian tribe as a result of the exercise of the tribe's sovereign power, is limited to the area of tribal jurisdiction.

*Subcontractor* means any entity (other than a person who is an employee of the contractor) which has a contract with a contractor to undertake a portion of the contractor's obligation for the performance of work generated by the expenditure of section 3 covered assistance, or arising in connection with a section 3 covered project.

*Very low-income person.* See the definition of "section 3 resident" in this section.

*Youthbuild programs.* See the definition of "HUD Youthbuild programs" in this section.

[59 FR 33880, June 30, 1994, as amended at 61 FR 5206, Feb. 9, 1996]

### **§ 135.7 Delegation of authority.**

Except as may be otherwise provided in this part, the functions and responsibilities of the Secretary under section 3, and described in this part, are delegated to the Assistant Secretary for Fair Housing and Equal Opportunity. The Assistant Secretary is further authorized to redelegate functions and responsibilities to other employees of HUD; *provided however*, that the authority to issue rules and regulations under this part, which authority is delegated to the Assistant Secretary, may not be redelegated by the Assistant Secretary.

## **§ 135.9 Requirements applicable to HUD NOFAs for section 3 covered programs.**

(a) *Certification of compliance with part 135.* All notices of funding availability (NOFAs) issued by HUD that announce the availability of funding covered by section 3 shall include a provision in the NOFA that notifies applicants that section 3 and the regulations in part 135 are applicable to funding awards made under the NOFA. Additionally the NOFA shall require as an application submission requirement (which may be specified in the NOFA or application kit) a certification by the applicant that the applicant will comply with the regulations in part 135. (For PHAs, this requirement will be met where a PHA Resolution in Support of the Application is submitted.) With respect to application evaluation, HUD will accept an applicant's certification unless there is evidence substantially challenging the certification.

(b) *Statement of purpose in NOFAs.* (1) For competitively awarded assistance in which the grants are for activities administered by an HA, and those activities are anticipated to generate significant training, employment or contracting opportunities, the NOFA must include a statement that one of the purposes of the assistance is to give to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, job training, employment, contracting and other economic opportunities to section 3 residents and section 3 business concerns.

(2) For competitively awarded assistance involving housing rehabilitation, construction or other public construction, where the amount awarded to the applicant may exceed \$200,000, the NOFA must include a statement that one of the purposes of the assistance is to give, to the greatest extent feasible, and consistent with existing Federal, State and local laws and regulations, job training, employment, contracting and other economic opportunities to section 3 residents and section 3 business concerns.

(c) *Section 3 as NOFA evaluation criteria.* Where not otherwise precluded by statute, in the evaluation of applications for the award of assistance, consideration shall be given to the extent to which an applicant has demonstrated that it will train and employ section 3 residents and contract with section 3 business concerns for economic opportunities generated in connection with the assisted project or activity. The evaluation criteria to be utilized, and the rating points to be assigned, will be specified in the NOFA.

## **§ 135.11 Other laws governing training, employment, and contracting.**

Other laws and requirements that are applicable or may be applicable to the economic opportunities generated from the expenditure of section 3 covered assistance include, but are not necessarily limited to those listed in this section.

(a) *Procurement standards for States and local governments (24 CFR 85.36).*—(1) *General.* Nothing in this part 135 prescribes specific methods of procurement. However, neither section 3 nor the requirements of this part 135 supersede the general requirement of 24 CFR 85.36(c) that all procurement transactions be conducted in a competitive manner. Consistent with 24 CFR 85.36(c)(2), section 3 is a Federal statute that expressly encourages, to the maximum extent feasible, a geographic preference in the evaluation of bids or proposals.

(2) *Flexible Subsidy Program.* Multifamily project mortgagors in the Flexible Subsidy Program are not required to utilize the methods of procurement in 24 CFR 85.36(d), and are not permitted to utilize methods of procurement that would result in their award of a contract to a business concern that submits a bid higher than the lowest responsive bid. A multifamily project mortgagor, however, must ensure that, to the greatest extent feasible, the procurement practices it selects provide preference to section 3 business concerns.

(b) *Procurement standards for other recipients (OMB Circular No. A-110).* Nothing in this part prescribes specific methods of procurement for grants and other agreements with institutions of higher education, hospitals, and other nonprofit organizations. Consistent with the requirements set forth in OMB Circular No. A-110, section 3 is a Federal statute that expressly encourages a geographic preference in the evaluation of bids or proposals.

(c) *Federal labor standards provisions.* Certain construction contracts are subject to compliance with the requirement to pay prevailing wages determined under Davis-Bacon Act (40 U.S.C. 276a—276a-7) and implementing U.S. Department of Labor regulations in 29 CFR part 5. Additionally, certain HUD-assisted

rehabilitation and maintenance activities on public and Indian housing developments are subject to compliance with the requirement to pay prevailing wage rates, as determined or adopted by HUD, to laborers and mechanics employed in this work. Apprentices and trainees may be utilized on this work only to the extent permitted under either Department of Labor regulations at 29 CFR part 5 or for work subject to HUD-determined prevailing wage rates, HUD policies and guidelines. These requirements include adherence to the wage rates and ratios of apprentices or trainees to journeymen set out in "approved apprenticeship and training programs," as described in paragraph (d) of this section.

(d) *Approved apprenticeship and trainee programs.* Certain apprenticeship and trainee programs have been approved by various Federal agencies. Approved apprenticeship and trainee programs include: an apprenticeship program approved by the Bureau of Apprenticeship and Training of the Department of Labor, or a State Apprenticeship Agency, or an on-the-job training program approved by the Bureau of Apprenticeship and Training, in accordance with the regulations at 29 CFR part 5; or a training program approved by HUD in accordance with HUD policies and guidelines, as applicable. Participation in an approved apprenticeship program does not, in and of itself, demonstrate compliance with the regulations of this part.

(e) *Compliance with Executive Order 11246.* Certain contractors covered by this part are subject to compliance with Executive Order 11246, as amended by Executive Order 12086, and the Department of Labor regulations issued pursuant thereto (41 CFR chapter 60) which provide that no person shall be discriminated against on the basis of race, color, religion, sex, or national origin in all phases of employment during the performance of Federal or Federally assisted construction contracts.

## **Subpart B—Economic Opportunities for Section 3 Residents and Section 3 Business Concerns**

### **§ 135.30 Numerical goals for meeting the greatest extent feasible requirement.**

(a) *General.* (1) Recipients and covered contractors may demonstrate compliance with the "greatest extent feasible" requirement of section 3 by meeting the numerical goals set forth in this section for providing training, employment, and contracting opportunities to section 3 residents and section 3 business concerns.

(2) The goals established in this section apply to the entire amount of section 3 covered assistance awarded to a recipient in any Federal Fiscal Year (FY), commencing with the first FY following the effective date of this rule.

(3) For recipients that do not engage in training, or hiring, but award contracts to contractors that will engage in training, hiring, and subcontracting, recipients must ensure that, to the greatest extent feasible, contractors will provide training, employment, and contracting opportunities to section 3 residents and section 3 business concerns.

(4) The numerical goals established in this section represent minimum numerical targets.

(b) *Training and employment.* The numerical goals set forth in paragraph (b) of this section apply to new hires. The numerical goals reflect the aggregate hires. Efforts to employ section 3 residents, to the greatest extent feasible, should be made at all job levels.

(1) *Numerical goals for section 3 covered public and Indian housing programs.* Recipients of section 3 covered public and Indian housing assistance (as described in §135.5) and their contractors and subcontractors may demonstrate compliance with this part by committing to employ section 3 residents as:

(i) 10 percent of the aggregate number of new hires for the one year period beginning in FY 1995;

(ii) 20 percent of the aggregate number of new hires for the one period beginning in FY 1996;

(iii) 30 percent of the aggregate number of new hires for one year period beginning in FY 1997 and continuing thereafter.

(2) *Numerical goals for other HUD programs covered by section 3.* (i) Recipients of section 3 covered housing assistance provided under other HUD programs, and their contractors and subcontractors (unless the contract or subcontract awards do not meet the threshold specified in §135.3(a)(3)) may demonstrate compliance with this part by committing to employ section 3 residents as 10 percent of the aggregate number of new hires for each year over the duration of the section 3 project;

(ii) Where a managing general partner or management agent is affiliated, in a given metropolitan area, with recipients of section 3 covered housing assistance, for an aggregate of 500 or more units in any fiscal year, the managing partner or management agent may demonstrate compliance with this part by committing to employ section 3 residents as:

(A) 10 percent of the aggregate number of new hires for the one year period beginning in FY 1995;

(B) 20 percent of the aggregate number of new hires for the one year period beginning in FY 1996;

(C) 30 percent of the aggregate number of new hires for the one year period beginning in FY 1997, and continuing thereafter.

(3) Recipients of section 3 covered community development assistance, and their contractors and subcontractors (unless the contract or subcontract awards do not meet the threshold specified in §135.3(a)(3)) may demonstrate compliance with the requirements of this part by committing to employ section 3 residents as:

(i) 10 percent of the aggregate number of new hires for the one year period beginning in FY 1995;

(ii) 20 percent of the aggregate number of new hires for the one year period beginning in FY 1996; and

(iii) 30 percent of the aggregate number of new hires for the one year period beginning in FY 1997 and continuing thereafter.

(c) *Contracts.* Numerical goals set forth in paragraph (c) of this section apply to contracts awarded in connection with all section 3 covered projects and section 3 covered activities. Each recipient and contractor and subcontractor (unless the contract or subcontract awards do not meet the threshold specified in §135.3(a)(3)) may demonstrate compliance with the requirements of this part by committing to award to section 3 business concerns:

(1) At least 10 percent of the total dollar amount of all section 3 covered contracts for building trades work for maintenance, repair, modernization or development of public or Indian housing, or for building trades work arising in connection with housing rehabilitation, housing construction and other public construction; and

(2) At least three (3) percent of the total dollar amount of all other section 3 covered contracts.

(d) *Safe harbor and compliance determinations.* (1) In the absence of evidence to the contrary, a recipient that meets the minimum numerical goals set forth in this section will be considered to have complied with the section 3 preference requirements.

(2) In evaluating compliance under subpart D of this part, a recipient that has not met the numerical goals set forth in this section has the burden of demonstrating why it was not feasible to meet the numerical goals set forth in this section. Such justification may include impediments encountered despite actions taken. A recipient or contractor also can indicate other economic opportunities, such as those listed in §135.40, which were provided in its efforts to comply with section 3 and the requirements of this part.

## **§ 135.32 Responsibilities of the recipient.**

Each recipient has the responsibility to comply with section 3 in its own operations, and ensure compliance in the operations of its contractors and subcontractors. This responsibility includes but may not be necessarily limited to:

- (a) Implementing procedures designed to notify section 3 residents about training and employment opportunities generated by section 3 covered assistance and section 3 business concerns about contracting opportunities generated by section 3 covered assistance;
- (b) Notifying potential contractors for section 3 covered projects of the requirements of this part, and incorporating the section 3 clause set forth in §135.38 in all solicitations and contracts.
- (c) Facilitating the training and employment of section 3 residents and the award of contracts to section 3 business concerns by undertaking activities such as described in the Appendix to this part, as appropriate, to reach the goals set forth in §135.30. Recipients, at their own discretion, may establish reasonable numerical goals for the training and employment of section 3 residents and contract award to section 3 business concerns that exceed those specified in §135.30;
- (d) Assisting and actively cooperating with the Assistant Secretary in obtaining the compliance of contractors and subcontractors with the requirements of this part, and refraining from entering into any contract with any contractor where the recipient has notice or knowledge that the contractor has been found in violation of the regulations in 24 CFR part 135.
- (e) Documenting actions taken to comply with the requirements of this part, the results of actions taken and impediments, if any.
- (f) A State or county which distributes funds for section 3 covered assistance to units of local governments, to the greatest extent feasible, must attempt to reach the numerical goals set forth in 135.30 regardless of the number of local governments receiving funds from the section 3 covered assistance which meet the thresholds for applicability set forth at 135.3. The State or county must inform units of local government to whom funds are distributed of the requirements of this part; assist local governments and their contractors in meeting the requirements and objectives of this part; and monitor the performance of local governments with respect to the objectives and requirements of this part.

#### **§ 135.34 Preference for section 3 residents in training and employment opportunities.**

- (a) *Order of providing preference.* Recipients, contractors and subcontractors shall direct their efforts to provide, to the greatest extent feasible, training and employment opportunities generated from the expenditure of section 3 covered assistance to section 3 residents in the order of priority provided in paragraph (a) of this section.
  - (1) *Public and Indian housing programs.* In public and Indian housing programs, efforts shall be directed to provide training and employment opportunities to section 3 residents in the following order of priority:
    - (i) Residents of the housing development or developments for which the section 3 covered assistance is expended (category 1 residents);
    - (ii) Residents of other housing developments managed by the HA that is expending the section 3 covered housing assistance (category 2 residents);
    - (iii) Participants in HUD Youthbuild programs being carried out in the metropolitan area (or nonmetropolitan county) in which the section 3 covered assistance is expended (category 3 residents);
    - (iv) Other section 3 residents.
  - (2) *Housing and community development programs.* In housing and community development programs, priority consideration shall be given, where feasible, to:

(i) Section 3 residents residing in the service area or neighborhood in which the section 3 covered project is located (collectively, referred to as category 1 residents); and

(ii) Participants in HUD Youthbuild programs (category 2 residents).

(iii) Where the section 3 project is assisted under the Stewart B. McKinney Homeless Assistance Act (42 U.S.C. 11301 *et seq.*), homeless persons residing in the service area or neighborhood in which the section 3 covered project is located shall be given the highest priority;

(iv) Other section 3 residents.

(3) Recipients of housing assistance programs administered by the Assistant Secretary for Housing may, at their own discretion, provide preference to residents of the housing development receiving the section 3 covered assistance within the service area or neighborhood where the section 3 covered project is located.

(4) Recipients of community development programs may, at their own discretion, provide priority to recipients of government assistance for housing, including recipients of certificates or vouchers under the Section 8 housing assistance program, within the service area or neighborhood where the section 3 covered project is located.

(b) *Eligibility for preference.* A section 3 resident seeking the preference in training and employment provided by this part shall certify, or submit evidence to the recipient contractor or subcontractor, if requested, that the person is a section 3 resident, as defined in §135.5. (An example of evidence of eligibility for the preference is evidence of receipt of public assistance, or evidence of participation in a public assistance program.)

(c) *Eligibility for employment.* Nothing in this part shall be construed to require the employment of a section 3 resident who does not meet the qualifications of the position to be filled.

#### **§ 135.36 Preference for section 3 business concerns in contracting opportunities.**

(a) *Order of providing preference.* Recipients, contractors and subcontractors shall direct their efforts to award section 3 covered contracts, to the greatest extent feasible, to section 3 business concerns in the order of priority provided in paragraph (a) of this section.

(1) *Public and Indian housing programs.* In public and Indian housing programs, efforts shall be directed to award contracts to section 3 business concerns in the following order of priority:

(i) Business concerns that are 51 percent or more owned by residents of the housing development or developments for which the section 3 covered assistance is expended, or whose full-time, permanent workforce includes 30 percent of these persons as employees (category 1 businesses);

(ii) Business concerns that are 51 percent or more owned by residents of other housing developments or developments managed by the HA that is expending the section 3 covered assistance, or whose full-time, permanent workforce includes 30 percent of these persons as employees (category 2 businesses); or

(iii) HUD Youthbuild programs being carried out in the metropolitan area (or nonmetropolitan county) in which the section 3 covered assistance is expended (category 3 businesses).

(iv) Business concerns that are 51 percent or more owned by section 3 residents, or whose permanent, full-time workforce includes no less than 30 percent section 3 residents (category 4 businesses), or that subcontract in excess of 25 percent of the total amount of subcontracts to business concerns identified in paragraphs (a)(1)(i) and (a)(1)(ii) of this section.

(2) *Housing and community development programs.* In housing and community development programs, priority consideration shall be given, where feasible, to:

- (i) Section 3 business concerns that provide economic opportunities for section 3 residents in the service area or neighborhood in which the section 3 covered project is located (category 1 businesses); and
  - (ii) Applicants (as this term is defined in 42 U.S.C. 12899) selected to carry out HUD Youthbuild programs (category 2 businesses);
  - (iii) Other section 3 business concerns.
- (b) *Eligibility for preference.* A business concern seeking to qualify for a section 3 contracting preference shall certify or submit evidence, if requested, that the business concern is a section 3 business concern as defined in §135.5.
- (c) *Ability to complete contract.* A section 3 business concern seeking a contract or a subcontract shall submit evidence to the recipient, contractor, or subcontractor (as applicable), if requested, sufficient to demonstrate to the satisfaction of the party awarding the contract that the business concern is responsible and has the ability to perform successfully under the terms and conditions of the proposed contract. (The ability to perform successfully under the terms and conditions of the proposed contract is required of all contractors and subcontractors subject to the procurement standards of 24 CFR 85.36 (see 24 CFR 85.36(b)(8)).) This regulation requires consideration of, among other factors, the potential contractor's record in complying with public policy requirements. Section 3 compliance is a matter properly considered as part of this determination.

#### **§ 135.38 Section 3 clause.**

All section 3 covered contracts shall include the following clause (referred to as the section 3 clause):

- A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- B. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.
- C. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- D. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.

E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.

F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

G. With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

#### **§ 135.40 Providing other economic opportunities.**

(a) *General.* In accordance with the findings of the Congress, as stated in section 3, that other economic opportunities offer an effective means of empowering low-income persons, a recipient is encouraged to undertake efforts to provide to low-income persons economic opportunities other than training, employment, and contract awards, in connection with section 3 covered assistance.

(b) *Other training and employment related opportunities.* Other economic opportunities to train and employ section 3 residents include, but need not be limited to, use of "upward mobility", "bridge" and trainee positions to fill vacancies; hiring section 3 residents in management and maintenance positions within other housing developments; and hiring section 3 residents in part-time positions.

(c) *Other business related economic opportunities.* (1) A recipient or contractor may provide economic opportunities to establish, stabilize or expand section 3 business concerns, including micro-enterprises. Such opportunities include, but are not limited to the formation of section 3 joint ventures, financial support for affiliating with franchise development, use of labor only contracts for building trades, purchase of supplies and materials from housing authority resident-owned businesses, purchase of materials and supplies from PHA resident-owned businesses and use of procedures under 24 CFR part 963 regarding HA contracts to HA resident-owned businesses. A recipient or contractor may employ these methods directly or may provide incentives to non-section 3 businesses to utilize such methods to provide other economic opportunities to low-income persons.

(2) A *section 3 joint venture* means an association of business concerns, one of which qualifies as a section 3 business concern, formed by written joint venture agreement to engage in and carry out a specific business venture for which purpose the business concerns combine their efforts, resources, and skills for joint profit, but not necessarily on a continuing or permanent basis for conducting business generally, and for which the section 3 business concern:

(i) Is responsible for a clearly defined portion of the work to be performed and holds management responsibilities in the joint venture; and

(ii) Performs at least 25 percent of the work and is contractually entitled to compensation proportionate to its work.

#### **Subpart C [Reserved]**

#### **Subpart D—Complaint and Compliance Review**

## **§ 135.70 General.**

(a) *Purpose.* The purpose of this subpart is to establish the procedures for handling complaints alleging noncompliance with the regulations of this part, and the procedures governing the Assistant Secretary's review of a recipient's or contractor's compliance with the regulations in this part.

(b) *Definitions.* For purposes of this subpart:

(1) *Complaint* means an allegation of noncompliance with regulations of this part made in the form described in §135.76(d).

(2) *Complainant* means the party which files a complaint with the Assistant Secretary alleging that a recipient or contractor has failed or refused to comply with the regulations in this part.

(3) *Noncompliance with section 3* means failure by a recipient or contractor to comply with the requirements of this part.

(4) *Respondent* means the recipient or contractor against which a complaint of noncompliance has been filed. The term "recipient" shall have the meaning set forth in §135.7, which includes PHA and IHA.

## **§ 135.72 Cooperation in achieving compliance.**

(a) The Assistant Secretary recognizes that the success of ensuring that section 3 residents and section 3 business concerns have the opportunity to apply for jobs and to bid for contracts generated by covered HUD financial assistance depends upon the cooperation and assistance of HUD recipients and their contractors and subcontractors. All recipients shall cooperate fully and promptly with the Assistant Secretary in section 3 compliance reviews, in investigations of allegations of noncompliance made under §135.76, and with the distribution and collection of data and information that the Assistant Secretary may require in connection with achieving the economic objectives of section 3.

(b) The recipient shall refrain from entering into a contract with any contractor after notification to the recipient by HUD that the contractor has been found in violation of the regulations in this part. The provisions of 24 CFR part 24 apply to the employment, engagement of services, awarding of contracts or funding of any contractors or subcontractors during any period of debarment, suspension or otherwise ineligible status.

## **§ 135.74 Section 3 compliance review procedures.**

(a) *Compliance reviews by Assistant Secretary.* The Assistant Secretary shall periodically conduct section 3 compliance reviews of selected recipients and contractors to determine whether these recipients are in compliance with the regulations in this part.

(b) *Form of compliance review.* A section 3 compliance review shall consist of a comprehensive analysis and evaluation of the recipient's or contractor's compliance with the requirements and obligations imposed by the regulations of this part, including an analysis of the extent to which section 3 residents have been hired and section 3 business concerns have been awarded contracts as a result of the methods undertaken by the recipient to achieve the employment, contracting and other economic objectives of section 3.

(c) *Where compliance review reveals noncompliance with section 3 by recipient or contractor.* Where the section 3 compliance review reveals that a recipient or contractor has not complied with section 3, the Assistant Secretary shall notify the recipient or contractor of its specific deficiencies in compliance with the regulations of this part, and shall advise the recipient or contractor of the means by which these deficiencies may be corrected. HUD shall conduct a follow-up review with the recipient or contractor to ensure that action is being taken to correct the deficiencies.

(d) *Continuing noncompliance by recipient or contractor.* A continuing failure or refusal by the recipient or contractor to comply with the regulations in this part may result in the application of sanctions specified in the contract through which HUD assistance is provided, or the application of sanctions specified in the

regulations governing the HUD program under which HUD financial assistance is provided. HUD will notify the recipient of any continuing failure or refusal by the contractor to comply with the regulations in this part for possible action under any procurement contract between the recipient and the contractor. Debarment, suspension and limited denial of participation pursuant to HUD's regulations in 24 CFR part 24, where appropriate, may be applied to the recipient or the contractor.

(e) *Conducting compliance review before the award of assistance.* Section 3 compliance reviews may be conducted before the award of contracts, and especially where the Assistant Secretary has reasonable grounds to believe that the recipient or contractor will be unable or unwilling to comply with the regulations in this part.

(f) *Consideration of complaints during compliance review.* Complaints alleging noncompliance with section 3, as provided in §135.76, may also be considered during any compliance review conducted to determine the recipient's conformance with regulations in this part.

#### **§ 135.76 Filing and processing complaints.**

(a) *Who may file a complaint.* The following individuals and business concerns may, personally or through an authorized representative, file with the Assistant Secretary a complaint alleging noncompliance with section 3:

(1) Any section 3 resident on behalf of himself or herself, or as a representative of persons similarly situated, seeking employment, training or other economic opportunities generated from the expenditure of section 3 covered assistance with a recipient or contractor, or by a representative who is not a section 3 resident but who represents one or more section 3 residents;

(2) Any section 3 business concern on behalf of itself, or as a representative of other section 3 business concerns similarly situated, seeking contract opportunities generated from the expenditure of section 3 covered assistance from a recipient or contractor, or by an individual representative of section 3 business concerns.

(b) *Where to file a complaint.* A complaint must be filed with the Assistant Secretary for Fair Housing and Equal Opportunity, Department of Housing and Urban Development, Washington, DC, 20410.

(c) *Time of filing.* (1) A complaint must be received not later than 180 days from the date of the action or omission upon which the complaint is based, unless the time for filing is extended by the Assistant Secretary for good cause shown.

(2) Where a complaint alleges noncompliance with section 3 and the regulations of this part that is continuing, as manifested in a number of incidents of noncompliance, the complaint will be timely if filed within 180 days of the last alleged occurrence of noncompliance.

(3) Where a complaint contains incomplete information, the Assistant Secretary shall request the needed information from the complainant. In the event this information is not furnished to the Assistant Secretary within sixty (60) days of the date of the request, the complaint may be closed.

(d) *Contents of complaint —(1) Written complaints.* Each complaint must be in writing, signed by the complainant, and include:

(i) The complainant's name and address;

(ii) The name and address of the respondent;

(iii) A description of the acts or omissions by the respondent that is sufficient to inform the Assistant Secretary of the nature and date of the alleged noncompliance.

(iv) A complainant may provide information to be contained in a complaint by telephone to HUD or any HUD Field Office, and HUD will reduce the information provided by telephone to writing on the prescribed complaint form and send the form to the complainant for signature.

(2) *Amendment of complaint.* Complaints may be reasonably and fairly amended at any time. Such amendments may include, but are not limited to, amendments to cure, technical defects or omissions, including failure to sign or affirm a complaint, to clarify or amplify the allegations in a complaint, or to join additional or substitute respondents. Except for the purposes of notifying respondents, amended complaints will be considered as having been made as of the original filing date.

(e) *Resolution of complaint by recipient.* (1) Within ten (10) days of timely filing of a complaint that contains complete information (in accordance with paragraphs (c) and (d) of this section), the Assistant Secretary shall determine whether the complainant alleges an action or omission by a recipient or the recipient's contractor that if proven qualifies as noncompliance with section 3. If a determination is made that there is an allegation of noncompliance with section 3, the complaint shall be sent to the recipient for resolution.

(2) If the recipient believes that the complaint lacks merit, the recipient must notify the Assistant Secretary in writing of this recommendation with supporting reasons, within 30 days of the date of receipt of the complaint. The determination that a complaint lacks merit is reserved to the Assistant Secretary.

(3) If the recipient determines that there is merit to the complaint, the recipient will have sixty (60) days from the date of receipt of the complaint to resolve the matter with the complainant. At the expiration of the 60-day period, the recipient must notify the Assistant Secretary in writing whether a resolution of the complaint has been reached. If resolution has been reached, the notification must be signed by both the recipient and the complainant, and must summarize the terms of the resolution reached between the two parties.

(4) Any request for an extension of the 60-day period by the recipient must be submitted in writing to the Assistant Secretary, and must include a statement explaining the need for the extension.

(5) If the recipient is unable to resolve the complaint within the 60-day period (or more if extended by the Assistant Secretary), the complaint shall be referred to the Assistant Secretary for handling.

(f) *Informal resolution of complaint by Assistant Secretary*—(1) *Dismissal of complaint.* Upon receipt of the recipient's written recommendation that there is no merit to the complaint, or upon failure of the recipient and complainant to reach resolution, the Assistant Secretary shall review the complaint to determine whether it presents a valid allegation of noncompliance with section 3. The Assistant Secretary may conduct further investigation if deemed necessary. Where the complaint fails to present a valid allegation of noncompliance with section 3, the Assistant Secretary will dismiss the complaint without further action. The Assistant Secretary shall notify the complainant of the dismissal of the complaint and the reasons for the dismissal.

(2) *Informal resolution.* Where the allegations in a complaint on their face, or as amplified by the statements of the complainant, present a valid allegation of noncompliance with section 3, the Assistant Secretary will attempt, through informal methods, to obtain a voluntary and just resolution of the complaint. Where attempts to resolve the complaint informally fail, the Assistant Secretary will impose a resolution on the recipient and complainant. Any resolution imposed by the Assistant Secretary will be in accordance with requirements and procedures concerning the imposition of sanctions or resolutions as set forth in the regulations governing the HUD program under which the section 3 covered assistance was provided.

(3) *Effective date of informal resolution.* The imposed resolution will become effective and binding at the expiration of 15 days following notification to recipient and complainant by certified mail of the imposed resolution, unless either party appeals the resolution before the expiration of the 15 days. Any appeal shall be in writing to the Secretary and shall include the basis for the appeal.

(g) *Sanctions.* Sanctions that may be imposed on recipients that fail to comply with the regulations of this part include debarment, suspension and limited denial of participation in HUD programs.

(h) *Investigation of complaint.* The Assistant Secretary reserves the right to investigate a complaint directly when, in the Assistant Secretary's discretion, the investigation would further the purposes of section 3 and this part.

(i) *Intimidatory or retaliatory acts prohibited.* No recipient or other person shall intimidate, threaten, coerce, or discriminate against any person or business because the person or business has made a complaint, testified, assisted or participated in any manner in an investigation, proceeding, or hearing under this part. The identity of complainants shall be kept confidential except to the extent necessary to carry out the purposes of this part, including the conduct of any investigation, hearing or judicial proceeding arising thereunder.

(j) *Judicial relief.* Nothing in this subpart D precludes a section 3 resident or section 3 business concerning from exercising the right, which may otherwise be available, to seek redress directly through judicial procedures.

(Approved by the Office of Management and Budget under control number 2529–0043)

## **Subpart E—Reporting and Recordkeeping**

### **§ 135.90 Reporting.**

Each recipient which receives directly from HUD financial assistance that is subject to the requirements of this part shall submit to the Assistant Secretary an annual report in such form and with such information as the Assistant Secretary may request, for the purpose of determining the effectiveness of section 3. Where the program providing the section 3 covered assistance requires submission of an annual performance report, the section 3 report will be submitted with that annual performance report. If the program providing the section 3 covered assistance does not require an annual performance report, the section 3 report is to be submitted by January 10 of each year or within 10 days of project completion, whichever is earlier. All reports submitted to HUD in accordance with the requirements of this part will be made available to the public.

(Approved by the Office of Management and Budget under control number 2529–0043)

### **§ 135.92 Recordkeeping and access to records.**

HUD shall have access to all records, reports, and other documents or items of the recipient that are maintained to demonstrate compliance with the requirements of this part, or that are maintained in accordance with the regulations governing the specific HUD program under which section 3 covered assistance is provided or otherwise made available to the recipient or contractor.

## **Appendix to Part 135**

### *I. Examples of Efforts To Offer Training and Employment Opportunities to Section 3 Residents*

- (1) Entering into "first source" hiring agreements with organizations representing Section 3 residents.
- (2) Sponsoring a HUD-certified "Step-Up" employment and training program for section 3 residents.
- (3) Establishing training programs, which are consistent with the requirements of the Department of Labor, for public and Indian housing residents and other section 3 residents in the building trades.
- (4) Advertising the training and employment positions by distributing flyers (which identify the positions to be filled, the qualifications required, and where to obtain additional information about the application process) to every occupied dwelling unit in the housing development or developments where category 1 or category 2 persons (as these terms are defined in §135.34) reside.

(5) Advertising the training and employment positions by posting flyers (which identify the positions to be filled, the qualifications required, and where to obtain additional information about the application process) in the common areas or other prominent areas of the housing development or developments. For HAs, post such advertising in the housing development or developments where category 1 or category 2 persons reside; for all other recipients, post such advertising in the housing development or developments and transitional housing in the neighborhood or service area of the section 3 covered project.

(6) Contacting resident councils, resident management corporations, or other resident organizations, where they exist, in the housing development or developments where category 1 or category 2 persons reside, and community organizations in HUD-assisted neighborhoods, to request the assistance of these organizations in notifying residents of the training and employment positions to be filled.

(7) Sponsoring (scheduling, advertising, financing or providing in-kind services) a job-informational meeting to be conducted by an HA or contractor representative or representatives at a location in the housing development or developments where category 1 or category 2 persons reside or in the neighborhood or service area of the section 3 covered project.

(8) Arranging assistance in conducting job interviews and completing job applications for residents of the housing development or developments where category 1 or category 2 persons reside and in the neighborhood or service area in which a section 3 project is located.

(9) Arranging for a location in the housing development or developments where category 1 persons reside, or the neighborhood or service area of the project, where job applications may be delivered to and collected by a recipient or contractor representative or representatives.

(10) Conducting job interviews at the housing development or developments where category 1 or category 2 persons reside, or at a location within the neighborhood or service area of the section 3 covered project.

(11) Contacting agencies administering HUD Youthbuild programs, and requesting their assistance in recruiting HUD Youthbuild program participants for the HA's or contractor's training and employment positions.

(12) Consulting with State and local agencies administering training programs funded through JTPA or JOBS, probation and parole agencies, unemployment compensation programs, community organizations and other officials or organizations to assist with recruiting Section 3 residents for the HA's or contractor's training and employment positions.

(13) Advertising the jobs to be filled through the local media, such as community television networks, newspapers of general circulation, and radio advertising.

(14) Employing a job coordinator, or contracting with a business concern that is licensed in the field of job placement (preferably one of the section 3 business concerns identified in part 135), that will undertake, on behalf of the HA, other recipient or contractor, the efforts to match eligible and qualified section 3 residents with the training and employment positions that the HA or contractor intends to fill.

(15) For an HA, employing section 3 residents directly on either a permanent or a temporary basis to perform work generated by section 3 assistance. (This type of employment is referred to as "force account labor" in HUD's Indian housing regulations. See 24 CFR 905.102, and §905.201(a)(6).)

(16) Where there are more qualified section 3 residents than there are positions to be filled, maintaining a file of eligible qualified section 3 residents for future employment positions.

(17) Undertaking job counseling, education and related programs in association with local educational institutions.

(18) Undertaking such continued job training efforts as may be necessary to ensure the continued employment of section 3 residents previously hired for employment opportunities.

(19) After selection of bidders but prior to execution of contracts, incorporating into the contract a negotiated provision for a specific number of public housing or other section 3 residents to be trained or employed on the section 3 covered assistance.

(20) Coordinating plans and implementation of economic development (e.g., job training and preparation, business development assistance for residents) with the planning for housing and community development.

*II. Examples of Efforts To Award Contracts to Section 3 Business Concerns*

(1) Utilizing procurement procedures for section 3 business concerns similar to those provided in 24 CFR part 905 for business concerns owned by Native Americans (see section III of this Appendix).

(2) In determining the responsibility of potential contractors, consider their record of section 3 compliance as evidenced by past actions and their current plans for the pending contract.

(3) Contacting business assistance agencies, minority contractors associations and community organizations to inform them of contracting opportunities and requesting their assistance in identifying section 3 businesses which may solicit bids or proposals for contracts for work in connection with section 3 covered assistance.

(4) Advertising contracting opportunities by posting notices, which provide general information about the work to be contracted and where to obtain additional information, in the common areas or other prominent areas of the housing development or developments owned and managed by the HA.

(5) For HAs, contacting resident councils, resident management corporations, or other resident organizations, where they exist, and requesting their assistance in identifying category 1 and category 2 business concerns.

(6) Providing written notice to all known section 3 business concerns of the contracting opportunities. This notice should be in sufficient time to allow the section 3 business concerns to respond to the bid invitations or request for proposals.

(7) Following up with section 3 business concerns that have expressed interest in the contracting opportunities by contacting them to provide additional information on the contracting opportunities.

(8) Coordinating pre-bid meetings at which section 3 business concerns could be informed of upcoming contracting and subcontracting opportunities.

(9) Carrying out workshops on contracting procedures and specific contract opportunities in a timely manner so that section 3 business concerns can take advantage of upcoming contracting opportunities, with such information being made available in languages other than English where appropriate.

(10) Advising section 3 business concerns as to where they may seek assistance to overcome limitations such as inability to obtain bonding, lines of credit, financing, or insurance.

(11) Arranging solicitations, times for the presentation of bids, quantities, specifications, and delivery schedules in ways to facilitate the participation of section 3 business concerns.

(12) Where appropriate, breaking out contract work items into economically feasible units to facilitate participation by section 3 business concerns.

(13) Contacting agencies administering HUD Youthbuild programs, and notifying these agencies of the contracting opportunities.

(14) Advertising the contracting opportunities through trade association papers and newsletters, and through the local media, such as community television networks, newspapers of general circulation, and radio advertising.

(15) Developing a list of eligible section 3 business concerns.

(16) For HAs, participating in the "Contracting with Resident-Owned Businesses" program provided under 24 CFR part 963.

(17) Establishing or sponsoring programs designed to assist residents of public or Indian housing in the creation and development of resident-owned businesses.

(18) Establishing numerical goals (number of awards and dollar amount of contracts) for award of contracts to section 3 business concerns.

(19) Supporting businesses which provide economic opportunities to low income persons by linking them to the support services available through the Small Business Administration (SBA), the Department of Commerce and comparable agencies at the State and local levels.

(20) Encouraging financial institutions, in carrying out their responsibilities under the Community Reinvestment Act, to provide no or low interest loans for providing working capital and other financial business needs.

(21) Actively supporting joint ventures with section 3 business concerns.

(22) Actively supporting the development or maintenance of business incubators which assist Section 3 business concerns.

### *III. Examples of Procurement Procedures That Provide for Preference for Section 3 Business Concerns*

This Section III provides specific procedures that may be followed by recipients and contractors (collectively, referred to as the "contracting party") for implementing the section 3 contracting preference for each of the competitive procurement methods authorized in 24 CFR 85.36(d).

(1) *Small Purchase Procedures.* For section 3 covered contracts aggregating no more than \$25,000, the methods set forth in this paragraph (1) or the more formal procedures set forth in paragraphs (2) and (3) of this Section III may be utilized.

(i) *Solicitation.* (A) Quotations may be solicited by telephone, letter or other informal procedure provided that the manner of solicitation provides for participation by a reasonable number of competitive sources. At the time of solicitation, the parties must be informed of:

- the section 3 covered contract to be awarded with sufficient specificity;
- the time within which quotations must be submitted; and
- the information that must be submitted with each quotation.

(B) If the method described in paragraph (i)(A) is utilized, there must be an attempt to obtain quotations from a minimum of three qualified sources in order to promote competition. Fewer than three quotations are acceptable when the contracting party has attempted, but has been unable, to obtain a sufficient number of competitive quotations. In unusual circumstances, the contracting party may accept the sole quotation received in response to a solicitation provided the price is reasonable. In all cases, the contracting party shall document the circumstances when it has been unable to obtain at least three quotations.

(ii) Award. (A) Where the section 3 covered contract is to be awarded based upon the lowest price, the contract shall be awarded to the qualified section 3 business concern with the lowest responsive quotation, if it is reasonable and no more than 10 percent higher than the quotation of the lowest responsive quotation from any qualified source. If no responsive quotation by a qualified section 3 business concern is within 10 percent of the lowest responsive quotation from any qualified source, the award shall be made to the source with the lowest quotation.

(B) Where the section 3 covered contract is to be awarded based on factors other than price, a request for quotations shall be issued by developing the particulars of the solicitation, including a rating system for the assignment of points to evaluate the merits of each quotation. The solicitation shall identify all factors to be considered, including price or cost. The rating system shall provide for a range of 15 to 25 percent of the total number of available rating points to be set aside for the provision of preference for section 3 business concerns. The purchase order shall be awarded to the responsible firm whose quotation is the most advantageous, considering price and all other factors specified in the rating system.

(2) *Procurement by sealed bids (Invitations for Bids).* Preference in the award of section 3 covered contracts that are awarded under a sealed bid (IFB) process may be provided as follows:

(i) Bids shall be solicited from all businesses (section 3 business concerns, and non-section 3 business concerns). An award shall be made to the qualified section 3 business concern with the highest priority ranking and with the lowest responsive bid if that bid—

(A) is within the maximum total contract price established in the contracting party's budget for the specific project for which bids are being taken, and

(B) is not more than "X" higher than the total bid price of the lowest responsive bid from any responsible bidder. "X" is determined as follows:

	x=lesser of:
When the lowest responsive bid is less than \$100,000	10% of that bid or \$9,000.
When the lowest responsive bid is:	
At least \$100,000, but less than \$200,000	9% of that bid, or \$16,000.
At least \$200,000, but less than \$300,000	8% of that bid, or \$21,000.
At least \$300,000, but less than \$400,000	7% of that bid, or \$24,000.
At least \$400,000, but less than \$500,000	6% of that bid, or \$25,000.
At least \$500,000, but less than \$1 million	5% of that bid, or \$40,000.
At least \$1 million, but less than \$2 million	4% of that bid, or \$60,000.
At least \$2 million, but less than \$4 million	3% of that bid, or \$80,000.
At least \$4 million, but less than \$7 million	2% of that bid, or \$105,000.
\$7 million or more	1 1/2% of the lowest responsive bid, with no dollar limit.

(ii) If no responsive bid by a section 3 business concern meets the requirements of paragraph (2)(i) of this section, the contract shall be awarded to a responsible bidder with the lowest responsive bid.

(3) *Procurement under the competitive proposals method of procurement (Request for Proposals (RFP)).* (i) For contracts and subcontracts awarded under the competitive proposals method of procurement (24 CFR 85.36(d)(3)), a Request for Proposals (RFP) shall identify all evaluation factors (and their relative importance) to be used to rate proposals.

(ii) One of the evaluation factors shall address both the preference for section 3 business concerns and the acceptability of the strategy for meeting the greatest extent feasible requirement (section 3 strategy), as disclosed in proposals submitted by all business concerns (section 3 and non-section 3 business concerns). This factor shall provide for a range of 15 to 25 percent of the total number of available points to be set aside for the evaluation of these two components.

(iii) The component of this evaluation factor designed to address the preference for section 3 business concerns must establish a preference for these business concerns in the order of priority ranking as described in 24 CFR 135.36.

(iv) With respect to the second component (the acceptability of the section 3 strategy), the RFP shall require the disclosure of the contractor's section 3 strategy to comply with the section 3 training and employment preference, or contracting preference, or both, if applicable. A determination of the contractor's responsibility will include the submission of an acceptable section 3 strategy. The contract award shall be made to the responsible firm (either section 3 or non-section 3 business concern) whose proposal is determined most advantageous, considering price and all other factors specified in the RFP.

December 22, 1987 must be cancelled, unless cancellation is determined by the Secretary not to be in the public interest. Determinations by the Secretary that cancellation is not in the public interest, or that waiver of the prohibitions should be granted with reference to a new contract or subcontract, will be made on a contract-by-contract basis. If such a determination is made, the Secretary will issue a waiver as authorized by the statute. Waiver requests, including facts concerning any contract or subcontract for which waiver is requested and a statement of the reasons why waiver would be in the public interest, should be forwarded by the grantee, directed to the Manager of the HUD Field Office for the State in which the grantee is carrying out the HUD-funded activity, or, in States with more than one Field Office, to the appropriate Field Office Manager. The Field Office Manager will forward all requests, with recommendations, to the Secretary for final determination. Waiver requests by contractors will not be considered. (Where, however, a grantee has requested a waiver from the Secretary, the contractor whose contract is the subject matter of the request may submit information in support of the request and the Secretary will consider it.)

It is the duty, under section 109, of every HUD grantee who has a covered contract (or whose contractor has a subcontract) with a contractor of a listed foreign country either (1) immediately to cancel the contract or to require the contractor to cancel the prohibited subcontract, or (2) promptly to request a waiver of the prohibition from the Secretary.

Waiver requests should describe the project, the sources of Federal grant funds for the project, the specifics concerning the contract for which waiver is being sought, including contract amount; dates that work was begun under the contract and the progress toward completion; the basis on which the contractor has been determined to be a contractor of a listed foreign country; details concerning the extent of foreign ownership of the contractor; facts concerning related subcontracts that are or may be subject to the prohibition which is the subject of this Notice, and the particular grounds upon which the waiver request is being made.

Comparable descriptive material must be submitted to accompany any request for waiver of the prohibitions as they relate to prospective contracts or subcontracts that, if awarded, would be

subject to the prohibitions in section 109.

In addition to the above-listed facts, waiver requests should include a recitation of the reasons the grantee believes it would be in the public interest to grant a waiver; the predicted financial and other consequences to the funded activity in the event waiver is not granted; and any other facts known to the grantee that would aid in the Secretary's determination.

No new contract with a contractor or subcontractor of a listed foreign country may be entered into during the pendency of a waiver request applicable to that contract. Existing contracts subject to the prohibitions described in this Notice must be suspended unless (1) the grantee certifies to the Secretary, and demonstrates factually, that suspension of work during the pendency of the waiver request would cause irreparable injury to the project; and (2) a waiver request is filed with the Secretary within 20 calendar days (including weekends and holidays) of the publication date of this Notice. (A grantee seeking to avoid suspension of an existing contract during the pendency of a waiver request may file the request later than 20 days following the publication date of this Notice if the grantee demonstrates that the involvement of a contractor or subcontractor subject to the prohibition was not discovered until a later time.) Work need not be suspended during the pendency of a waiver request that includes the above-described grantee certification unless and until the Secretary notifies the grantee that the certification has been rejected.

Any decision with regard to a requested waiver applicable to a contract will be made after a review of the specific facts involved. In addition to consideration of public purpose arguments in support of maintenance of the contract or waiver of the prohibition on a new contract, other factors that will be considered by the Secretary will include the national security interests of the United States; the availability of necessary products or services; and costs to the taxpayers that significantly exceed the costs associated with cancelling the contract and awarding another for similar products or services.

Notice of any waiver granted by the Secretary shall be published in the Federal Register within 10 days after the Secretary's determination. The Notice shall describe in detail the contract or subcontract involved and the specific reasons for granting the waiver.

The prohibitions contained in sections 109 are in addition to any other

restrictions contained in any other Federal law, including the Buy American Act (41 U.S.C. 10a-10d).

#### Solicitation Provisions and Use of Contract Clauses

The Department believes that section 109 is a self-executing statute affecting the right of Federal departments and agencies and their grantees to contract. Accordingly, the department does not believe that it is necessary, in order to give legal effect to the prohibitions, to amend existing contracts with HUD contractors, or for grantees to amend existing contracts solely to reflect the prohibitions contained in the statute.

However, the Department has added appropriate contract provisions to covered HUD contracts, in accordance with the directions provided in interim amendments to the Federal Acquisition Regulation published on April 12, 1988, and by this Notice the Department is directing all grantees to include, as appropriate, solicitation provisions and contract clauses identical to or based upon the clauses set out below in all further contracts and in amendments to existing contracts involving HUD assistance subject to the prohibitions.

#### Solicitation Provisions

Grantees soliciting bids or requesting proposals for contracts for the construction, alteration, or repair of any public building or public work project subject to the prohibitions described in this Notice shall include in their solicitations the following provisions:

#### Restrictions on Public Buildings and Public Works Projects Certification

(a) *Definitions.* The definitions pertaining to this provision are those that are set forth in the clause entitled, "Restrictions on Public Works Projects." (Set out under "Contract Clauses" below.)

(b) *Certification.* Except as provided in paragraph (c) of this provision, by submission of its bid or proposal, the offeror certifies that it—

(1) Is not a Contractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR) (see paragraph (h) of this provision);

(2) Has not or will not enter into any subcontract with a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR; and

(3) Will not provide any product of a country included on the list of foreign countries that discriminate against U.S. firms published by the USTR.

(c) *Inability to certify.* An offeror unable to certify in accordance with paragraph (b) of this provision shall submit with its offer a written explanation fully describing the reasons for its inability to make the certification.

(d) *Applicability of 18 U.S.C. 1001.* The certification in paragraph (b) of this provision concerns a matter within the jurisdiction of an agency of the United States, and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, U.S.C. 1001.

(e) *Notice.* The offeror shall provide immediate written notice to the Contracting Officer if, at any time before the contract award, the offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(f) *Restrictions on contract award.* Unless a waiver to these restrictions is granted by the Secretary of Housing and Urban Development, no contract will be awarded to an offeror (1) who is owned or controlled by a citizen or national of a foreign country included on the list of foreign countries that discriminate against U.S. firms published by the USTR, (2) whose subcontractors are owned or controlled by citizens or nationals of a foreign country on the USTR list or, (3) who incorporates any product of a foreign country on the USTR list in the public works project.

(g) *Recordkeeping.* Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (b) of this provision. The knowledge and information of an offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(h) *USTR list.* The USTR published an initial list in the Federal Register on December 30, 1987 (53 FR 49244), which identified one country—Japan. The USTR can add countries to the list, and remove countries from it, in accordance with section 109(c) of Pub. L. 100-202.

[End of Solicitation Clause]

#### *Contract Clauses*

Grantees or subgrantee recipients entering into contracts for construction, alteration, or repair of any public building or public work project subject to the prohibitions described in this Notice shall include the following provisions in all such contracts:

#### *Restrictions on Public Buildings and Public Works Projects*

(a) *Definitions.* "Component," as used in this clause, means those articles,

materials, and supplies incorporated directly into the product.

"Contractor or subcontractor of a foreign country," as used in this clause, means any Contractor or subcontractor that is a citizen or national of a foreign country or is controlled directly or indirectly by citizens or nationals of a foreign country. A contractor or subcontractor shall be considered to be a citizen or national of a foreign country, or controlled directly or indirectly by citizens or nationals of a foreign country—

(1) If 50 percent or more of the Contractor or subcontractor is owned by a citizen or a national of the foreign country;

(2) If the title to 50 percent or more of the stock of the Contractor or subcontractor is held subject to trust or fiduciary obligation in favor of citizens or nationals of the foreign country;

(3) If 50 percent or more of the voting power in the Contractor or subcontractor is vested in or exercisable on behalf of a citizen or national of the foreign country;

(4) In the case of a partnership, if any general partner is a citizen of the foreign country;

(5) In the case of a corporation, if its president or other chief executive officer or the chairman of its board of directors is a citizen of the foreign country or the majority of any number of its directors necessary to constitute a quorum are citizens of the foreign country or the corporation is organized under the laws of the foreign country or any subdivision, territory, or possession thereof; or

(6) In the case of a contractor or subcontractor who is a joint venture, if any participant firm is a citizen or national of a foreign country or meets any of the criteria in subparagraphs (a)(1) through (5) of this clause.

"Product," as used in this clause, means construction materials—i.e., articles, materials, and supplies brought to the construction site for incorporation into the public works project, including permanently affixed equipment, instruments, utilities, electronic or other devices, but not including vehicles or construction equipment. In determining the origin of a product [insert name of grantee], will consider a product as produced in a foreign country if it has been assembled or manufactured in the foreign country, or if the cost of the components mined, produced, or manufactured in the foreign country exceed 50 percent of the cost of all its components.

(b) *Restrictions.* The Contractor shall not (1) knowingly enter into any subcontract under this contract with a

subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the United States Trade Representative (see paragraph (c) of this clause), or (2) supply any product under this contract of a country included on the list of foreign countries that discriminate against U.S. firms published by the USTR.

(c) *USTR list.* The USTR published an initial list in the Federal Register on December 30, 1987 (53 FR 49244), which identified one country—Japan. The USTR can add other countries to the list, or remove countries from it, in accordance with section 109(c) of Pub. L. 100-202.

(d) *Certification.* The Contractor may rely upon the certification of a prospective subcontractor that it is not a subcontractor of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR and that products supplied by such subcontractor for use on the Federal public works project under this contract are not products of a foreign country included on the list of foreign countries that discriminate against U.S. firms published by the USTR, unless such Contractor has knowledge that the certification is erroneous.

(e) *Subcontracts.* The Contractor shall incorporate this clause, modified only for the purpose of properly identifying the parties, in all subcontracts. This paragraph (e) shall also be incorporated in all subcontracts.

[End of Contract Clause]

Questions concerning the applicability of section 109 to particular contracts or subcontracts should be directed to the individuals whose names and addresses appear at the beginning of this document.

Date: June 8, 1988.

Samuel R. Pierce, Jr.,

Secretary.

[FR Doc. 88-13661 Filed 6-15-88; 8:45 am]

BILLING CODE 6210-32-W

## Federal Labor Standards Provisions

U.S. Department of Housing  
and Urban Development  
Office of Labor Relations

### Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) **Minimum Wages.** All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section I(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
  - (2) The classification is utilized in the area by the construction industry; and
  - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)
- (c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)
- (d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- (iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program. Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. **Withholding.** HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract in the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) **Payrolls and basic records.** Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been

communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### 4. Apprentices and Trainees.

(i) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who

is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) **Trainees.** Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) **Equal employment opportunity.** The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

**5. Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

**6. Subcontracts.** The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

**7. Contract termination; debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act Requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

**9. Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

**10. (i) Certification of Eligibility.** By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be

awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes any statement knowing the same to be false..... shall be fined not more than \$5,000 or imprisoned not more than two years, or both."

**11. Complaints, Proceedings, or Testimony by Employees.** No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

**B. Contract Work Hours and Safety Standards Act.** The provisions of this paragraph B are applicable where the amount of the prime contract exceeds \$100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) **Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) **Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in subparagraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds \$100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

# General Conditions for Construction Contracts - Public Housing Programs

U.S. Department of Housing and Urban Development

Office of Public and Indian Housing

OMB Approval No. 2577-0157 (exp. 3/31/2010)

**Applicability.** This form is applicable to any construction/development contract greater than \$100,000.

This form includes those clauses required by OMB's common rule on grantee procurement, implemented at HUD in 24 CFR 85.36, and those requirements set forth in Section 3 of the Housing and Urban Development Act of 1968 and its amendment by the Housing and Community Development Act of 1992, implemented by HUD at 24 CFR Part 135. The form is required for construction contracts awarded by Public Housing Agencies (PHAs).

The form is used by Housing Authorities in solicitations to provide necessary contract clauses. If the form were not used, HAs would be unable to enforce their contracts.

Public reporting burden for this collection of information is estimated to average 1.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Responses to the collection of information are required to obtain a benefit or to retain a benefit.

The information requested does not lend itself to confidentiality.

HUD may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB number.

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## 1. Definitions

- (a) "Architect" means the person or other entity engaged by the PHA to perform architectural, engineering, design, and other services related to the work as provided for in the contract. When a PHA uses an engineer to act in this capacity, the terms "architect" and "engineer" shall be synonymous. The Architect shall serve as a technical representative of the Contracting Officer. The Architect's authority is as set forth elsewhere in this contract.
- (b) "Contract" means the contract entered into between the PHA and the Contractor. It includes the forms of Bid, the Bid Bond, the Performance and Payment Bond or Bonds or other assurance of completion, the Certifications, Representations, and Other Statements of Bidders (form HUD-5370), these General Conditions of the Contract for Construction (form HUD-5370), the applicable wage rate determinations from the U.S. Department of Labor, any special conditions included elsewhere in the contract, the specifications, and drawings. It includes all formal changes to any of those documents by addendum, change order, or other modification.
- (c) "Contracting Officer" means the person delegated the authority by the PHA to enter into, administer, and/or terminate this contract and designated as such in writing to the Contractor. The term includes any successor Contracting Officer and any duly authorized representative of the Contracting Officer also designated in writing. The Contracting Officer shall be deemed the authorized agent of the PHA in all dealings with the Contractor.
- (d) "Contractor" means the person or other entity entering into the contract with the PHA to perform all of the work required under the contract.
- (e) "Drawings" means the drawings enumerated in the schedule of drawings contained in the Specifications and as described in the contract clause entitled Specifications and Drawings for Construction herein.
- (f) "HUD" means the United States of America acting through the Department of Housing and Urban Development including the Secretary, or any other person designated to act on its behalf. HUD has agreed, subject to the provisions of an Annual Contributions Contract (ACC), to provide financial assistance to the PHA, which includes assistance in financing the work to be performed under this contract. As defined elsewhere in these General Conditions or the contract documents, the determination of HUD may be required to authorize changes in the work or for release of funds to the PHA for payment to the Contractor. Notwithstanding HUD's role, nothing in this contract shall be construed to create any contractual relationship between the Contractor and HUD.
- (g) "Project" means the entire project, whether construction or rehabilitation, the work for which is provided for in whole or in part under this contract.
- (h) "PHA" means the Public Housing Agency organized under applicable state laws which is a party to this contract.
- (i) "Specifications" means the written description of the technical requirements for construction and includes the criteria and tests for determining whether the requirements are met.
- (j) "Work" means materials, workmanship, and manufacture and fabrication of components.

## 2. Contractor's Responsibility for Work

- (a) The Contractor shall furnish all necessary labor, materials, tools, equipment, and transportation necessary for performance of the work. The Contractor shall also furnish all necessary water, heat, light, and power not made available to the Contractor by the PHA pursuant to the clause entitled Availability and Use of Utility Services herein.
- (b) The Contractor shall perform on the site, and with its own organization, work equivalent to at least [ ] (12 percent unless otherwise indicated) of the total amount of work to be performed under the order. This percentage may be reduced by a supplemental agreement to this order if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the PHA.
- (c) At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.
- (d) The Contractor shall be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence, and shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. The Contractor shall hold and save the PHA, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.
- (e) The Contractor shall lay out the work from base lines and bench marks indicated on the drawings and be responsible for all lines, levels, and measurements of all work executed under the contract. The Contractor shall verify the figures before laying out the work and will be held responsible for any error resulting from its failure to do so.
- (f) The Contractor shall confine all operations (including storage of materials) on PHA premises to areas authorized or approved by the Contracting Officer.
- (g) The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. After completing the work and before final inspection, the Contractor shall (1) remove from the premises all scaffolding, equipment, tools, and materials (including rejected materials) that are not the property of the PHA and all rubbish caused by its work; (2) leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer; (3) perform all specified tests; and, (4) deliver the installation in complete and operating condition.
- (h) The Contractor's responsibility will terminate when all work has been completed, the final inspection made, and the work accepted by the Contracting Officer. The Contractor will then be released from further obligation except as required by the warranties specified elsewhere in the contract.

## 3. Architect's Duties, Responsibilities, and Authority

- (a) The Architect for this contract, and any successor, shall be designated in writing by the Contracting Officer.

- (b) The Architect shall serve as the Contracting Officer's technical representative with respect to architectural, engineering, and design matters related to the work performed under the contract. The Architect may provide direction on contract performance. Such direction shall be within the scope of the contract and may not be of a nature which: (1) institutes additional work outside the scope of the contract; (2) constitutes a change as defined in the Changes clause herein; (3) causes an increase or decrease in the cost of the contract; (4) alters the Construction Progress Schedule; or (5) changes any of the other express terms or conditions of the contract.
- (c) The Architect's duties and responsibilities may include but shall not be limited to:
- (1) Making periodic visits to the work site, and on the basis of his/her on-site inspections, issuing written reports to the PHA which shall include all observed deficiencies. The Architect shall file a copy of the report with the Contractor's designated representative at the site;
  - (2) Making modifications in drawings and technical specifications and assisting the Contracting Officer in the preparation of change orders and other contract modifications for issuance by the Contracting Officer;
  - (3) Reviewing and making recommendations with respect to - (i) the Contractor's construction progress schedules; (ii) the Contractor's shop and detailed drawings; (iii) the machinery, mechanical and other equipment and materials or other articles proposed for use by the Contractor; and, (iv) the Contractor's price breakdown and progress payment estimates; and,
  - (4) Assisting in inspections, signing Certificates of Completion, and making recommendations with respect to acceptance of work completed under the contract.

#### 4. Other Contracts

The PHA may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with PHA employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by PHA employees.

#### Construction Requirements

##### 5. Pre-construction Conference and Notice to Proceed

- (a) Within ten calendar days of contract execution, and prior to the commencement of work, the Contractor shall attend a preconstruction conference with representatives of the PHA, its Architect, and other interested parties convened by the PHA. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract. The PHA will provide the Contractor with the date, time, and place of the conference.
- (b) The contractor shall begin work upon receipt of a written Notice to Proceed from the Contracting Officer or designee. The Contractor shall not begin work prior to receiving such notice.

#### 6. Construction Progress Schedule

- (a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring labor, materials, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments or take other remedies under the contract until the Contractor submits the required schedule.
- (b) The Contractor shall enter the actual progress on the chart as required by the Contracting Officer, and immediately deliver three copies of the annotated schedule to the Contracting Officer. If the Contracting Officer determines, upon the basis of inspection conducted pursuant to the clause entitled Inspection and Acceptance of Construction, herein that the Contractor is not meeting the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the PHA. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.
- (c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the Contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the Default clause of this contract.

#### 7. Site Investigation and Conditions Affecting the Work

- (a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to, (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is

- reasonably ascertainable from an inspection of the site, including all exploratory work done by the PHA, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the PHA.
- (b) The PHA assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the PHA. Nor does the PHA assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.
- 8. Differing Site Conditions**
- (a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of (1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or (2) unknown physical conditions at the site(s), of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.
- (b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. Work shall not proceed at the affected site, except at the Contractor's risk, until the Contracting Officer has provided written instructions to the Contractor. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, the Contractor shall file a claim in writing to the PHA within ten days after receipt of such instructions and, in any event, before proceeding with the work. An equitable adjustment in the contract price, the delivery schedule, or both shall be made under this clause and the contract modified in writing accordingly.
- (c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.
- (d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.
- 9. Specifications and Drawings for Construction**
- (a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.
- (b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by", or "acceptable to", or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.
- (c) Where "as shown", "as indicated", "as detailed", or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place" that is "furnished and installed".
- (d) "Shop drawings" means drawings, submitted to the PHA by the Contractor, subcontractor, or any lower tier subcontractor, showing in detail (1) the proposed fabrication and assembly of structural elements and (2) the installation (i.e., form, fit, and attachment details) of materials of equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The PHA may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.
- (e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with other contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the PHA's reasons therefore. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.
- (f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Architect approves any such variation and the Contracting Officer concurs, the Contracting Officer shall issue an appropriate modification to the contract, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.
- (g) It shall be the responsibility of the Contractor to make timely requests of the PHA for such large scale and full size drawings, color schemes, and other additional information, not already in his possession, which shall be

- required in the planning and production of the work. Such requests may be submitted as the need arises, but each such request shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay.
- (h) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the PHA and one set will be returned to the Contractor. As required by the Contracting Officer, the Contractor, upon completing the work under this contract, shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the work is completed and accepted.
- (i) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all shop drawings prepared by subcontractors are submitted to the Contracting Officer.

## 10. As-Built Drawings

- (a) "As-built drawings," as used in this clause, means drawings submitted by the Contractor or subcontractor at any tier to show the construction of a particular structure or work as actually completed under the contract. "As-built drawings" shall be synonymous with "Record drawings."
- (b) As required by the Contracting Officer, the Contractor shall provide the Contracting Officer accurate information to be used in the preparation of permanent as-built drawings. For this purpose, the Contractor shall record on one set of contract drawings all changes from the installations originally indicated, and record final locations of underground lines by depth from finish grade and by accurate horizontal offset distances to permanent surface improvements such as buildings, curbs, or edges of walks.
- (c) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all as-built drawings prepared by subcontractors are submitted to the Contracting Officer.

## 11. Material and Workmanship

- (a) All equipment, material, and articles furnished under this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the contract to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of, and as approved by the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

- (b) Approval of equipment and materials.
- (1) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the

machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

- (2) When required by the specifications or the Contracting Officer, the Contractor shall submit appropriately marked samples (and certificates related to them) for approval at the Contractor's expense, with all shipping charges prepaid. The Contractor shall label, or otherwise properly mark on the container, the material or product represented, its place of origin, the name of the producer, the Contractor's name, and the identification of the construction project for which the material or product is intended to be used.
- (3) Certificates shall be submitted in triplicate, describing each sample submitted for approval and certifying that the material, equipment or accessory complies with contract requirements. The certificates shall include the name and brand of the product, name of manufacturer, and the location where produced.
- (4) Approval of a sample shall not constitute a waiver of the PHA right to demand full compliance with contract requirements. Materials, equipment and accessories may be rejected for cause even though samples have been approved.
- (5) Wherever materials are required to comply with recognized standards or specifications, such specifications shall be accepted as establishing the technical qualities and testing methods, but shall not govern the number of tests required to be made nor modify other contract requirements. The Contracting Officer may require laboratory test reports on items submitted for approval or may approve materials on the basis of data submitted in certificates with samples. Check tests will be made on materials delivered for use only as frequently as the Contracting Officer determines necessary to insure compliance of materials with the specifications. The Contractor will assume all costs of retesting materials which fail to meet contract requirements and/or testing materials offered in substitution for those found deficient.
- (6) After approval, samples will be kept in the Project office until completion of work. They may be built into the work after a substantial quantity of the materials they represent has been built in and accepted.
- (c) Requirements concerning lead-based paint. The Contractor shall comply with the requirements concerning lead-based paint contained in the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846) as implemented by 24 CFR Part 35.

## 12. Permits and Codes

- (a) The Contractor shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations. Notwithstanding the requirement of the Contractor to comply with the drawings and specifications in the contract, all work installed shall comply with all applicable codes and regulations as amended by any

- waivers. Before installing the work, the Contractor shall examine the drawings and the specifications for compliance with applicable codes and regulations bearing on the work and shall immediately report any discrepancy it may discover to the Contracting Officer. Where the requirements of the drawings and specifications fail to comply with the applicable code or regulation, the Contracting Officer shall modify the contract by change order pursuant to the clause entitled Changes herein to conform to the code or regulation.
- (b) The Contractor shall secure and pay for all permits, fees, and licenses necessary for the proper execution and completion of the work. Where the PHA can arrange for the issuance of all or part of these permits, fees and licenses, without cost to the Contractor, the contract amount shall be reduced accordingly.

### 13. Health, Safety, and Accident Prevention

- (a) In performing this contract, the Contractor shall:
- (1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation;
  - (2) Protect the lives, health, and safety of other persons;
  - (3) Prevent damage to property, materials, supplies, and equipment; and,
  - (4) Avoid work interruptions.
- (b) For these purposes, the Contractor shall:
- (1) Comply with regulations and standards issued by the Secretary of Labor at 29 CFR Part 1926. Failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96), 40 U.S.C. 3701 et seq.; and
  - (2) Include the terms of this clause in every subcontract so that such terms will be binding on each subcontractor.
- (c) The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Part 1904.
- (d) The Contracting Officer shall notify the Contractor of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Contractor or the Contractor's representative at the site of the work, shall be deemed sufficient notice of the noncompliance and corrective action required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to take corrective action promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.
- (e) The Contractor shall be responsible for its subcontractors' compliance with the provisions of this clause. The Contractor shall take such action with respect to any subcontract as the PHA, the Secretary of Housing and Urban Development, or the Secretary of Labor shall direct as a means of enforcing such provisions.

### 14. Temporary Heating

The Contractor shall provide and pay for temporary heating, covering, and enclosures necessary to properly protect all work and materials against damage by dampness and cold, to dry out the work, and to facilitate the completion of the work. Any permanent heating equipment used shall be turned over to the PHA in the condition and at the time required by the specifications.

### 15. Availability and Use of Utility Services

- (a) The PHA shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the PHA or, where the utility is produced by the PHA, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.
- (b) The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the PHA, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

### 16. Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements

- (a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed under this contract, and which do not unreasonably interfere with the work required under this contract.
- (b) The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during performance of this contract, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.
- (c) The Contractor shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. Prior to disturbing the ground at the construction site, the Contractor shall ensure that all underground utility lines are clearly marked.
- (d) The Contractor shall shore up, brace, underpin, secure, and protect as necessary all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be affected by the excavations or other operations connected with the construction of the project.
- (e) Any equipment temporarily removed as a result of work under this contract shall be protected, cleaned, and replaced in the same condition as at the time of award of this contract.

- (f) New work which connects to existing work shall correspond in all respects with that to which it connects and/or be similar to existing work unless otherwise required by the specifications.
- (g) No structural members shall be altered or in any way weakened without the written authorization of the Contracting Officer, unless such work is clearly specified in the plans or specifications.
- (h) If the removal of the existing work exposes discolored or unfinished surfaces, or work out of alignment, such surfaces shall be refinished, or the material replaced as necessary to make the continuous work uniform and harmonious. This, however, shall not be construed to require the refinishing or reconstruction of dissimilar finishes previously exposed, or finished surfaces in good condition, but in different planes or on different levels when brought together by the removal of intervening work, unless such refinishing or reconstruction is specified in the plans or specifications.
- (i) The Contractor shall give all required notices to any adjoining or adjacent property owner or other party before the commencement of any work.
- (j) The Contractor shall indemnify and save harmless the PHA from any damages on account of settlement or the loss of lateral support of adjoining property, any damages from changes in topography affecting drainage, and from all loss or expense and all damages for which the PHA may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.
- (k) The Contractor shall repair any damage to vegetation, structures, equipment, utilities, or improvements, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

## 17. Temporary Buildings and Transportation of Materials

- (a) Temporary buildings (e.g., storage sheds, shops, offices, sanitary facilities) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the PHA. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- (b) The Contractor shall, as directed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any federal, state, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

## 18. Clean Air and Water

The contractor shall comply with the Clean Air Act, as amended, 42 USC 7401 et seq., the Federal Water Pollution Control Water Act, as amended, 33 U.S.C. 1251 et seq., and standards issued pursuant thereto in the facilities in which this contract is to be performed.

## 19. Energy Efficiency

The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub.L. 94-163) for the State in which the work under the contract is performed.

## 20. Inspection and Acceptance of Construction

- (a) Definitions. As used in this clause -
- (1) "Acceptance" means the act of an authorized representative of the PHA by which the PHA approves and assumes ownership of the work performed under this contract. Acceptance may be partial or complete.
  - (2) "Inspection" means examining and testing the work performed under the contract (including, when appropriate, raw materials, equipment, components, and intermediate assemblies) to determine whether it conforms to contract requirements.
  - (3) "Testing" means that element of inspection that determines the properties or elements, including functional operation of materials, equipment, or their components, by the application of established scientific principles and procedures.
- (b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. All work is subject to PHA inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.
- (c) PHA inspections and tests are for the sole benefit of the PHA and do not (1) relieve the Contractor of responsibility for providing adequate quality control measures; (2) relieve the Contractor of responsibility for loss or damage of the material before acceptance; (3) constitute or imply acceptance; or, (4) affect the continuing rights of the PHA after acceptance of the completed work under paragraph (j) below.
- (d) The presence or absence of the PHA inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specifications without the Contracting Officer's written authorization. All instructions and approvals with respect to the work shall be given to the Contractor by the Contracting Officer.
- (e) The Contractor shall promptly furnish, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The PHA may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The PHA shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

- (f) The PHA may conduct routine inspections of the construction site on a daily basis.
- (g) The Contractor shall, without charge, replace or correct work found by the PHA not to conform to contract requirements, unless the PHA decides that it is in its interest to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.
- (h) If the Contractor does not promptly replace or correct rejected work, the PHA may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor, or (2) terminate for default the Contractor's right to proceed.
- (i) If any work requiring inspection is covered up without approval of the PHA, it must, if requested by the Contracting Officer, be uncovered at the expense of the Contractor. If at any time before final acceptance of the entire work, the PHA considers it necessary or advisable, to examine work already completed by removing or tearing it out, the Contractor, shall on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray all the expenses of the examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the Contracting Officer shall make an equitable adjustment to cover the cost of the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.
- (j) The Contractor shall notify the Contracting Officer, in writing, as to the date when in its opinion all or a designated portion of the work will be substantially completed and ready for inspection. If the Architect determines that the state of preparedness is as represented, the PHA will promptly arrange for the inspection. Unless otherwise specified in the contract, the PHA shall accept, as soon as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines and designates can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the PHA's right under any warranty or guarantee.

## 21. Use and Possession Prior to Completion

- (a) The PHA shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the PHA intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The PHA's possession or use shall not be deemed an acceptance of any work under the contract.
- (b) While the PHA has such possession or use, the Contractor shall be relieved of the responsibility for (1) the loss of or damage to the work resulting from the PHA's possession or use, notwithstanding the terms of the clause entitled Permits and Codes herein; (2) all maintenance costs on the areas occupied; and, (3) furnishing heat, light, power, and water used in the areas

occupied without proper remuneration therefore. If prior possession or use by the PHA delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

## 22. Warranty of Title

The Contractor warrants good title to all materials, supplies, and equipment incorporated in the work and agrees to deliver the premises together with all improvements thereon free from any claims, liens or charges, and agrees further that neither it nor any other person, firm or corporation shall have any right to a lien upon the premises or anything appurtenant thereto.

## 23. Warranty of Construction

- (a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (j) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of \_\_\_\_\_ (one year unless otherwise indicated) from the date of final acceptance of the work. If the PHA takes possession of any part of the work before final acceptance, this warranty shall continue for a period of (one year unless otherwise indicated) from the date that the PHA takes possession.
- (b) The Contractor shall remedy, at the Contractor's expense, any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to PHA-owned or controlled real or personal property when the damage is the result of—  
(1) The Contractor's failure to conform to contract requirements; or  
(2) Any defects of equipment, material, workmanship or design furnished by the Contractor.
- (c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for (one year unless otherwise indicated) from the date of repair or replacement.
- (d) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect or damage.
- (e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the PHA shall have the right to replace, repair or otherwise remedy the failure, defect, or damage at the Contractor's expense.
- (f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:  
(1) Obtain all warranties that would be given in normal commercial practice;  
(2) Require all warranties to be executed in writing, for the benefit of the PHA; and,  
(3) Enforce all warranties for the benefit of the PHA.
- (g) In the event the Contractor's warranty under paragraph (a) of this clause has expired, the PHA may bring suit at its own expense to enforce a subcontractor's, manufacturer's or supplier's warranty.

- (h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defect of material or design furnished by the PHA nor for the repair of any damage that results from any defect in PHA furnished material or design.
- (i) Notwithstanding any provisions herein to the contrary, the establishment of the time periods in paragraphs (a) and (c) above relate only to the specific obligation of the Contractor to correct the work, and have no relationship to the time within which its obligation to comply with the contract may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to its obligation other than specifically to correct the work.
- (j) This warranty shall not limit the PHA's rights under the Inspection and Acceptance of Construction clause of this contract with respect to latent defects, gross mistakes or fraud.

#### 24. Prohibition Against Liens

The Contractor is prohibited from placing a lien on the PHA's property. This prohibition shall apply to all subcontractors at any tier and all materials suppliers.

#### Administrative Requirements

##### 25. Contract Period

The Contractor shall complete all work required under this contract within \_\_\_\_\_ calendar days of the effective date of the contract, or within the time schedule established in the notice to proceed issued by the Contracting Officer.

##### 26. Order of Provisions

In the event of a conflict between these General Conditions and the Specifications, the General Conditions shall prevail. In the event of a conflict between the contract and any applicable state or local law or regulation, the state or local law or regulation shall prevail; provided that such state or local law or regulation does not conflict with, or is less restrictive than applicable federal law, regulation, or Executive Order. In the event of such a conflict, applicable federal law, regulation, and Executive Order shall prevail.

##### 27. Payments

- (a) The PHA shall pay the Contractor the price as provided in this contract.
- (b) The PHA shall make progress payments approximately every 30 days as the work proceeds, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer. The PHA may, subject to written determination and approval of the Contracting Officer, make more frequent payments to contractors which are qualified small businesses.
- (c) Before the first progress payment under this contract, the Contractor shall furnish, in such detail as requested by the Contracting Officer, a breakdown of the total contract price showing the amount included therein for each principal category of the work, which shall substantiate the payment amount requested in order to provide a

basis for determining progress payments. The breakdown shall be approved by the Contracting Officer and must be acceptable to HUD. If the contract covers more than one project, the Contractor shall furnish a separate breakdown for each. The values and quantities employed in making up this breakdown are for determining the amount of progress payments and shall not be construed as a basis for additions to or deductions from the contract price. The Contractor shall prorate its overhead and profit over the construction period of the contract.

- (d) The Contractor shall submit, on forms provided by the PHA, periodic estimates showing the value of the work performed during each period based upon the approved breakdown of the contract price. Such estimates shall be submitted not later than \_\_\_\_\_ days in advance of the date set for payment and are subject to correction and revision as required. The estimates must be approved by the Contracting Officer with the concurrence of the Architect prior to payment. If the contract covers more than one project, the Contractor shall furnish a separate progress payment estimate for each.
- (e) Along with each request for progress payments and the required estimates, the Contractor shall furnish the following certification, or payment shall not be made:  
I hereby certify, to the best of my knowledge and belief, that:
- (1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;
  - (2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements; and,
  - (3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract.

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

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

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

- (f) Except as otherwise provided in State law, the PHA shall retain ten (10) percent of the amount of progress payments until completion and acceptance of all work under the contract; except, that if upon completion of 50 percent of the work, the Contracting Officer, after consulting with the Architect, determines that the Contractor's performance and progress are satisfactory, the PHA may make the remaining payments in full for the work subsequently completed. If the Contracting Officer subsequently determines that the Contractor's performance and progress are unsatisfactory, the PHA shall reinstate the ten (10) percent (or other percentage as provided in State law) retainage until such time as the Contracting Officer determines that performance and progress are satisfactory.
- (g) The Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration when computing progress payments.

- Material delivered to the Contractor at locations other than the site may also be taken into consideration if the Contractor furnishes satisfactory evidence that (1) it has acquired title to such material; (2) the material is properly stored in a bonded warehouse, storage yard, or similar suitable place as may be approved by the Contracting Officer; (3) the material is insured to cover its full value; and (4) the material will be used to perform this contract. Before any progress payment which includes delivered material is made, the Contractor shall furnish such documentation as the Contracting Officer may require to assure the protection of the PHA's interest in such materials. The Contractor shall remain responsible for such stored material notwithstanding the transfer of title to the PHA.
- (h) All material and work covered by progress payments made shall, at the time of payment become the sole property of the PHA, but this shall not be construed as (1) relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or, (2) waiving the right of the PHA to require the fulfillment of all of the terms of the contract. In the event the work of the Contractor has been damaged by other contractors or persons other than employees of the PHA in the course of their employment, the Contractor shall restore such damaged work without cost to the PHA and to seek redress for its damage only from those who directly caused it.
- (i) The PHA shall make the final payment due the Contractor under this contract after (1) completion and final acceptance of all work; and (2) presentation of release of all claims against the PHA arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. Each such exception shall embrace no more than one claim, the basis and scope of which shall be clearly defined. The amounts for such excepted claims shall not be included in the request for final payment. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned.
- (j) Prior to making any payment, the Contracting Officer may require the Contractor to furnish receipts or other evidence of payment from all persons performing work and supplying material to the Contractor, if the Contracting Officer determines such evidence is necessary to substantiate claimed costs.
- (k) The PHA shall not; (1) determine or adjust any claims for payment or disputes arising there under between the Contractor and its subcontractors or material suppliers; or, (2) withhold any moneys for the protection of the subcontractors or material suppliers. The failure or refusal of the PHA to withhold moneys from the Contractor shall in nowise impair the obligations of any surety or sureties under any bonds furnished under this contract.

## 28. Contract Modifications

- (a) Only the Contracting Officer has authority to modify any term or condition of this contract. Any contract modification shall be authorized in writing.
- (b) The Contracting Officer may modify the contract unilaterally (1) pursuant to a specific authorization stated in a contract clause (e.g., Changes); or (2) for administrative matters which do not change the rights or

responsibilities of the parties (e.g., change in the PHA address). All other contract modifications shall be in the form of supplemental agreements signed by the Contractor and the Contracting Officer.

- (c) When a proposed modification requires the approval of HUD prior to its issuance (e.g., a change order that exceeds the PHA's approved threshold), such modification shall not be effective until the required approval is received by the PHA.

## 29. Changes

- (a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract including changes:
- (1) In the specifications (including drawings and designs);
  - (2) In the method or manner of performance of the work;
  - (3) PHA-furnished facilities, equipment, materials, services, or site; or,
  - (4) Directing the acceleration in the performance of the work.
- (b) Any other written order or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating (1) the date, circumstances and source of the order and (2) that the Contractor regards the order as a change order.
- (c) Except as provided in this clause, no order, statement or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.
- (d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for a adjustment based on defective specifications, no proposal for any change under paragraph (b) above shall be allowed for any costs incurred more than 20 days (5 days for oral orders) before the Contractor gives written notice as required. In the case of defective specifications for which the PHA is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.
- (e) The Contractor must assert its right to an adjustment under this clause within 30 days after (1) receipt of a written change order under paragraph (a) of this clause, or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting a written statement describing the general nature and the amount of the proposal. If the facts justify it, the Contracting Officer may extend the period for submission. The proposal may be included in the notice required under paragraph (b) above. No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.
- (f) The Contractor's written proposal for equitable adjustment shall be submitted in the form of a lump sum proposal supported with an itemized breakdown of all increases and decreases in the contract in at least the following details:

- (1) Direct Costs. Materials (list individual items, the quantity and unit cost of each, and the aggregate cost); Transportation and delivery costs associated with materials; Labor breakdowns by hours or unit costs (identified with specific work to be performed); Construction equipment exclusively necessary for the change; Costs of preparation and/or revision to shop drawings resulting from the change; Worker's Compensation and Public Liability Insurance; Employment taxes under FICA and FUTA; and, Bond Costs when size of change warrants revision.
- (2) Indirect Costs. Indirect costs may include overhead, general and administrative expenses, and fringe benefits not normally treated as direct costs.
- (3) Profit. The amount of profit shall be negotiated and may vary according to the nature, extent, and complexity of the work required by the change.
- The allowability of the direct and indirect costs shall be determined in accordance with the Contract Cost Principles and Procedures for Commercial Firms in Part 31 of the Federal Acquisition Regulation (48 CFR 1-31), as implemented by HUD Handbook 2210.18, in effect on the date of this contract. The Contractor shall not be allowed a profit on the profit received by any subcontractor. Equitable adjustments for deleted work shall include a credit for profit and may include a credit for indirect costs. On proposals covering both increases and decreases in the amount of the contract, the application of indirect costs and profit shall be on the net-change in direct costs for the Contractor or subcontractor performing the work.
- (g) The Contractor shall include in the proposal its request for time extension (if any), and shall include sufficient information and dates to demonstrate whether and to what extent the change will delay the completion of the contract in its entirety.
- (h) The Contracting Officer shall act on proposals within 30 days after their receipt, or notify the Contractor of the date when such action will be taken.
- (i) Failure to reach an agreement on any proposal shall be a dispute under the clause entitled Disputes herein. Nothing in this clause, however, shall excuse the Contractor from proceeding with the contract as changed.
- (j) Except in an emergency endangering life or property, no change shall be made by the Contractor without a prior order from the Contracting Officer.

### 30. Suspension of Work

- (a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the PHA.
- (b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified (or within a reasonable time if not specified) in this contract an adjustment shall be made for any increase in the cost of performance of the contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have

been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or for which any equitable adjustment is provided for or excluded under any other provision of this contract.

(c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order); and, (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

### 31. Disputes

- (a) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. A claim arising under the contract, unlike a claim relating to the contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim by complying with the requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.
- (b) Except for disputes arising under the clauses entitled Labor Standards - Davis Bacon and Related Acts, herein, all disputes arising under or relating to this contract, including any claims for damages for the alleged breach thereof which are not disposed of by agreement, shall be resolved under this clause.
- (c) All claims by the Contractor shall be made in writing and submitted to the Contracting Officer for a written decision. A claim by the PHA against the Contractor shall be subject to a written decision by the Contracting Officer.
- (d) The Contracting Officer shall, within 60 (unless otherwise indicated) days after receipt of the request, decide the claim or notify the Contractor of the date by which the decision will be made.
- (e) The Contracting Officer's decision shall be final unless the Contractor (1) appeals in writing to a higher level in the PHA in accordance with the PHA's policy and procedures, (2) refers the appeal to an independent mediator or arbitrator, or (3) files suit in a court of competent jurisdiction. Such appeal must be made within (30 unless otherwise indicated) days after receipt of the Contracting Officer's decision.
- (f) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

### 32. Default

- (a) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with the diligence that will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within this time, the Contracting Officer may, by written notice to the Contractor, terminate the right to

- proceed with the work (or separable part of the work) that has been delayed. In this event, the PHA may take over the work and complete it, by contract or otherwise, and may take possession of and use any materials, equipment, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the PHA resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the PHA in completing the work.
- (b) The Contractor's right to proceed shall not be terminated or the Contractor charged with damages under this clause if—
- (1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include (i) acts of God, or of the public enemy, (ii) acts of the PHA or other governmental entity in either its sovereign or contractual capacity, (iii) acts of another contractor in the performance of a contract with the PHA, (iv) fires, (v) floods, (vi) epidemics, (vii) quarantine restrictions, (viii) strikes, (ix) freight embargoes, (x) unusually severe weather, or (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and
- (2) The Contractor, within days (10 days unless otherwise indicated) from the beginning of such delay (unless extended by the Contracting Officer) notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, time for completing the work shall be extended by written modification to the contract. The findings of the Contracting Officer shall be reduced to a written decision which shall be subject to the provisions of the Disputes clause of this contract.
- (c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been for convenience of the PHA.

### 33. Liquidated Damages

- (a) If the Contractor fails to complete the work within the time specified in the contract, or any extension, as specified in the clause entitled Default of this contract, the Contractor shall pay to the PHA as liquidated damages, the sum of \$\_\_\_\_\_ [Contracting Officer insert amount] for each day of delay. If different completion dates are specified in the contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another clause in this contract, liquidated damages shall not be due the PHA. The Contractor remains liable for damages caused other than by delay.
- (b) If the PHA terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final

completion of the work together with any increased costs occasioned the PHA in completing the work.

- (c) If the PHA does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

### 34. Termination for Convenience

- (a) The Contracting Officer may terminate this contract in whole, or in part, whenever the Contracting Officer determines that such termination is in the best interest of the PHA. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which the performance of the work under the contract is terminated, and the date upon which such termination becomes effective.
- (b) If the performance of the work is terminated, either in whole or in part, the PHA shall be liable to the Contractor for reasonable and proper costs resulting from such termination upon the receipt by the PHA of a properly presented claim setting out in detail: (1) the total cost of the work performed to date of termination less the total amount of contract payments made to the Contractor; (2) the cost (including reasonable profit) of settling and paying claims under subcontracts and material orders for work performed and materials and supplies delivered to the site, payment for which has not been made by the PHA to the Contractor or by the Contractor to the subcontractor or supplier; (3) the cost of preserving and protecting the work already performed until the PHA or assignee takes possession thereof or assumes responsibility therefore; (4) the actual or estimated cost of legal and accounting services reasonably necessary to prepare and present the termination claim to the PHA; and (5) an amount constituting a reasonable profit on the value of the work performed by the Contractor.
- (c) The Contracting Officer will act on the Contractor's claim within days (60 days unless otherwise indicated) of receipt of the Contractor's claim.
- (d) Any disputes with regard to this clause are expressly made subject to the provisions of the Disputes clause of this contract.

### 35. Assignment of Contract

The Contractor shall not assign or transfer any interest in this contract; except that claims for monies due or to become due from the PHA under the contract may be assigned to a bank, trust company, or other financial institution. Such assignments of claims shall only be made with the written concurrence of the Contracting Officer. If the Contractor is a partnership, this contract shall inure to the benefit of the surviving or remaining member(s) of such partnership as approved by the Contracting Officer.

### 36. Insurance

- (a) Before commencing work, the Contractor and each subcontractor shall furnish the PHA with certificates of insurance showing the following insurance is in force and will insure all operations under the Contract:
- (1) Workers' Compensation, in accordance with state or Territorial Workers' Compensation laws.
- (2) Commercial General Liability with a combined single limit for bodily injury and property damage of not less than \$\_\_\_\_\_ [Contracting Officer insert amount]

- per occurrence to protect the Contractor and each subcontractor against claims for bodily injury or death and damage to the property of others. This shall cover the use of all equipment, hoists, and vehicles on the site(s) not covered by Automobile Liability under (3) below. If the Contractor has a "claims-made" policy, then the following additional requirements apply: the policy must provide a "retroactive date" which must be on or before the execution date of the Contract; and the extended reporting period may not be less than five years following the completion date of the Contract.
- (3) Automobile Liability on owned and non-owned motor vehicles used on the site(s) or in connection therewith for a combined single limit for bodily injury and property damage of not less than \$\_\_\_\_\_ [Contracting Officer insert amount] per occurrence.
- (b) Before commencing work, the Contractor shall furnish the PHA with a certificate of insurance evidencing that Builder's Risk (fire and extended coverage) Insurance on all work in place and/or materials stored at the building site(s), including foundations and building equipment, is in force. The Builder's Risk Insurance shall be for the benefit of the Contractor and the PHA as their interests may appear and each shall be named in the policy or policies as an insured. The Contractor in installing equipment supplied by the PHA shall carry insurance on such equipment from the time the Contractor takes possession thereof until the Contract work is accepted by the PHA. The Builder's Risk Insurance need not be carried on excavations, piers, footings, or foundations until such time as work on the superstructure is started. It need not be carried on landscape work. Policies shall furnish coverage at all times for the full cash value of all completed construction, as well as materials in place and/or stored at the site(s), whether or not partial payment has been made by the PHA. The Contractor may terminate this insurance on buildings as of the date taken over for occupancy by the PHA. The Contractor is not required to carry Builder's Risk Insurance for modernization work which does not involve structural alterations or additions and where the PHA's existing fire and extended coverage policy can be endorsed to include such work.
- (c) All insurance shall be carried with companies which are financially responsible and admitted to do business in the State in which the project is located. If any such insurance is due to expire during the construction period, the Contractor (including subcontractors, as applicable) shall not permit the coverage to lapse and shall furnish evidence of coverage to the Contracting Officer. All certificates of insurance, as evidence of coverage, shall provide that no coverage may be canceled or non-renewed by the insurance company until at least 30 days prior written notice has been given to the Contracting Officer.

### 37. Subcontracts

- (a) Definitions. As used in this contract -
- (1) "Subcontract" means any contract, purchase order, or other purchase agreement, including modifications and change orders to the foregoing, entered into by a subcontractor to furnish supplies, materials, equipment, and services for the performance of the prime contract or a subcontract.

- (2) "Subcontractor" means any supplier, vendor, or firm that furnishes supplies, materials, equipment, or services to or for the Contractor or another subcontractor.
- (b) The Contractor shall not enter into any subcontract with any subcontractor who has been temporarily denied participation in a HUD program or who has been suspended or debarred from participating in contracting programs by any agency of the United States Government or of the state in which the work under this contract is to be performed.
- (c) The Contractor shall be as fully responsible for the acts or omissions of its subcontractors, and of persons either directly or indirectly employed by them as for the acts or omissions of persons directly employed by the Contractor.
- (d) The Contractor shall insert appropriate clauses in all subcontracts to bind subcontractors to the terms and conditions of this contract insofar as they are applicable to the work of subcontractors.
- (e) Nothing contained in this contract shall create any contractual relationship between any subcontractor and the PHA or between the subcontractor and HUD.

### 38. Subcontracting with Small and Minority Firms, Women's Business Enterprise, and Labor Surplus Area Firms

The Contractor shall take the following steps to ensure that, whenever possible, subcontracts are awarded to small business firms, minority firms, women's business enterprises, and labor surplus area firms:

- (a) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
- (b) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;
- (c) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;
- (d) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises; and
- (e) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies.

### 39. Equal Employment Opportunity

During the performance of this contract, the Contractor agrees as follows:

- (a) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, or handicap.
- (b) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, national origin, or handicap. Such action shall include, but not be limited to, (1) employment, (2) upgrading, (3) demotion, (4) transfer, (5) recruitment or recruitment advertising, (6) layoff or termination, (7) rates of pay or other forms of compensation, and (8) selection for training, including apprenticeship.

- (c) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.
- (d) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, or handicap.
- (e) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.
- (f) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.
- (g) The Contractor shall furnish all information and reports required by Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto. The Contractor shall permit access to its books, records, and accounts by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (h) In the event of a determination that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part, and the Contractor may be declared ineligible for further Government contracts, or Federally assisted construction contracts under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended, the rules, regulations, and orders of the Secretary of Labor, or as otherwise provided by law.
- (i) The Contractor shall include the terms and conditions of this clause in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor. The Contractor shall take such action with respect to any subcontract or purchase order as the Secretary of Housing and Urban Development or the Secretary of Labor may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.
- (j) Compliance with the requirements of this clause shall be to the maximum extent consistent with, but not in derogation of, compliance with section 7(b) of the Indian Self-Determination and Education Assistance Act and the Indian Preference clause of this contract.
- 40. Employment, Training, and Contracting Opportunities for Low-Income Persons, Section 3 of the Housing and Urban Development Act of 1968.**
- (a) The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
- (b) The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the Part 135 regulations.
- (c) The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
- (d) The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR Part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR Part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 135.
- (e) The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR Part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR Part 135.
- (f) Noncompliance with HUD's regulations in 24 CFR Part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
- (g) With respect to work performed in connection with section 3 covered Indian housing assistance, section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e) also applies to the work to be performed under this contract. Section 7(b) requires that to the greatest extent feasible (i) preference and opportunities for training and employment shall be given to Indians, and (ii) preference in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned Economic Enterprises. Parties to this contract that are subject to the provisions of section 3 and section 7(b) agree to comply with section 3 to the maximum extent feasible, but not in derogation of compliance with section 7(b).

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**41. Interest of Members of Congress**

No member or delegate to the Congress of the United States of America shall be admitted to any share or part of this contract or to any benefit that may arise therefrom.

**42. Interest of Members, Officers, or Employees and Former Members, Officers, or Employees**

No member, officer, or employee of the PHA, no member of the governing body of the locality in which the project is situated, no member of the governing body of the locality in which the PHA was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the project, shall, during his or her tenure, or for one year thereafter, have any interest, direct or indirect, in this contract or the proceeds thereof.

**43. Limitations on Payments made to Influence Certain Federal Financial Transactions**

- (a) The Contractor agrees to comply with Section 1352 of Title 31, United States Code which prohibits the use of Federal appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.
- (b) The Contractor further agrees to comply with the requirement of the Act to furnish a disclosure (OMB Standard Form LLL, Disclosure of Lobbying Activities) if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

**44. Royalties and Patents**

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringement of any patent rights and shall save the PHA harmless from loss on account thereof, except that the PHA shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified and the Contractor has no reason to believe that the specified design, process, or product is an infringement. If, however, the Contractor has reason to believe that any design, process or product specified is an infringement of a patent, the Contractor shall promptly notify the Contracting Officer. Failure to give such notice shall make the Contractor responsible for resultant loss.

**45. Examination and Retention of Contractor's Records**

(a) The PHA, HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until 3 years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

(b) The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders not exceeding \$10,000.

(c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under the Disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which the PHA, HUD, or Comptroller General or any of their duly authorized representatives has taken exception shall continue until disposition of such appeals, litigation, claims, or exceptions.

**46. Labor Standards - Davis-Bacon and Related Acts**

If the total amount of this contract exceeds \$2,000, the Federal labor standards set forth in the clause below shall apply to the development or construction work to be performed under the contract.

## (a) Minimum Wages.

(1) All laborers and mechanics employed under this contract in the development or construction of the project(s) involved will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the regular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall

be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

- (2) (i) Any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met: (A) The work to be performed by the classification requested is not performed by a classification in the wage determination; and (B) The classification is utilized in the area by the construction industry; and (C) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
- (ii) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employee Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
- (iii) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.
- (iv) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (a)(2)(ii) or (iii) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in classification.
- (3) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (4) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the

amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

- (b) Withholding of funds. HUD or its designee shall, upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working in the construction or development of the project, all or part of the wages required by the contract, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the Contractor, disburse such amounts withheld for and on account of the Contractor or subcontractor to the respective employees to whom they are due.
- (c) Payrolls and basic records.

- (1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working in the construction or development of the project. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under 29 CFR 5.5(a)(1)(iv), that the wages of any laborer or mechanic include the amount of costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

- (2) (i) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under subparagraph (c)(1) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1214-0149.)
- (ii) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
- (A) That the payroll for the payroll period contains the information required to be maintained under paragraph (c)(1) of this clause and that such information is correct and complete;
- (B) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3; and
- (C) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
- (iii) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirements for submission of the "Statement of Compliance" required by subparagraph (c)(2)(ii) of this clause.
- (iv) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.
- (3) The Contractor or subcontractor shall make the records required under subparagraph (c)(1) available for inspection, copying, or transcription by authorized representatives of HUD or its designee, the Contracting Officer, or the Department of Labor and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.
- (d) (1) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship and Training, Employer and Labor Services (OATELS), or with a State Apprenticeship Agency recognized by OATELS, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by OATELS or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event OATELS, or a State Apprenticeship Agency recognized by OATELS, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (2) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under

- the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (3) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.
- (e) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.
- (f) Contract termination; debarment. A breach of this contract clause may be grounds for termination of the contract and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.
- (g) Compliance with Davis-Bacon and related Act requirements. All rulings and interpretations of the Davis-Bacon and related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (h) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this clause shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the PHA, HUD, the U.S. Department of Labor, or the employees or their representatives.
- (i) Certification of eligibility.
- (1) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a United States Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
- (3) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.
- (j) Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.
- (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the provisions set forth in subparagraph (j)(1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic (including watchmen and guards) employed in violation of the provisions set forth in subparagraph (j)(1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by provisions set forth in subparagraph (j)(1) of this clause.
- (3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions set forth in subparagraph (j)(2) of this clause.
- (k) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts all the provisions contained in this clause, and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these provisions in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these provisions.

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#### **47. Non-Federal Prevailing Wage Rates**

- (a) Any prevailing wage rate (including basic hourly rate and any fringe benefits), determined under State or tribal law to be prevailing, with respect to any employee in any trade or position employed under the contract, is inapplicable to the contract and shall not be enforced against the Contractor or any subcontractor, with respect to employees engaged under the contract whenever such non-Federal prevailing wage rate exceeds:
- (1) The applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 3141 et seq.) to be prevailing in the locality with respect to such trade;
- (b) An applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the U.S. Department of Labor (DOL) or a DOL-recognized State Apprenticeship Agency; or
- (c) An applicable trainee wage rate based thereon specified in a DOL-certified trainee program.

#### **48. Procurement of Recovered Materials.**

- (a) in accordance with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, the Contractor shall procure items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition. The Contractor shall procure items designated in the EPA guidelines that contain the highest percentage of recovered materials practicable unless the Contractor determines that such items: (1) are not reasonably available in a reasonable period of time; (2) fail to meet reasonable performance standards, which shall be determined on the basis of the guidelines of the National Institute of Standards and Technology, if applicable to the item; or (3) are only available at an unreasonable price.
- (b) Paragraph (a) of this clause shall apply to items purchased under this contract where: (1) the Contractor purchases in excess of \$10,000 of the item under this contract; or (2) during the preceding Federal fiscal year, the Contractor: (i) purchased any amount of the items for use under a contract that was funded with Federal appropriations and was with a Federal agency or a State agency or agency of a political subdivision of a State; and (ii) purchased a total of in excess of \$10,000 of the item both under and outside that contract.

**CITY OF SALEM**  
Contracts and Procurement Division  
555 Liberty Street SE, Room 330  
Salem, Oregon 97302

Date:

Contractor:

Procurement Description: ~~Subcontractor ADA-SI~~

Re: Contractor Debarment/Suspension Certificate.....

Dear:

Prior to the award of a procurement contract, the Contractor recommended for award of this contract is required to provide debarment/suspension certification indicating compliance with the below Federal Executive Order. You can comply with this requirement for Certification by completing, signing and submitting this form. The City will not award a contract to a debarred, suspended, or otherwise in violation of EO 12549, Contractor.

**Debarment:**

Federal Executive Order (E.O.) 12549 "Debarment and Suspension" requires that all contractors receiving individual awards, using federal funds, and all sub-recipients certify that the organization and its principals are not debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency from doing business with the Federal Government.

Your signature certifies that neither you nor your principal is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency.

(Name)

(Company)

(Address)

Phone No. \_\_\_\_\_

FAX No. \_\_\_\_\_

E-Mail \_\_\_\_\_

\_\_\_\_\_  
Signature \_\_\_\_\_ Date \_\_\_\_\_

If you have question, please contact me at (503) 588-6136.

Sincerely,

For City Use Only:

Verified by: \_\_\_\_\_ / \_\_\_\_\_ (Date)

**U.S. Department of Housing  
and Urban Development**  
Office of Public and Indian Housing

OMB Approval No. 2577-0157 (exp.01/31/2014)

**Contract Provisions Required by Federal Law  
or Owner Contract with the  
U.S. Department of Housing and Urban Development**

Public reporting burden for this collection of information is estimated to average 3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. This agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless that collection displays a valid OMB control number.

These contracts between a HUD grantee (housing agency (HA)) and an architect/engineer (A/E) for design and construction services do not require either party to submit any materials to HUD. The forms provide a contractual agreement for the services to be provided by the A/E and establishes responsibilities of both parties pursuant to the contract. The regulatory authority is 24 CFR 85.36. These contractual agreements are required by Federal law or regulation pursuant to 24 CFR Part 85.36. Signing of the contracts is required to obtain or retain benefits. The contracts do not lend themselves to confidentiality.

## 1.0 Contract Provisions Required by Federal Law or Owner Contract with the U.S. Department of Housing and Urban Development (HUD).

**1.1 Contract Adjustments.** Notwithstanding any other term or condition of this Agreement, any settlement or equitable adjustment due to termination, suspension or delays by the Owner shall be negotiated based on the cost principles stated at 48 CFR Subpart 31.2 and conform to the Contract pricing provisions of 24 CFR 85.36 (f).

**1.2 Additional Services.** The Owner shall perform a cost or price analysis as required by 24 CFR 85.36 (F) prior to the issuance of a contract modification/amendment for Additional Services. Such Additional Services shall be within the general scope of services covered by this Agreement. The Design Professional shall provide supporting cost information in sufficient detail to permit the Owner to perform the required cost or price analysis.

**1.3 Restrictive Drawings and Specifications.** In accordance with 24 CFR 85.36(c)(3)(i) and contract agreements between the Owner and HUD, the Design Professional shall not require the use of materials, products, or services that unduly restrict competition.

**1.4 Design Certification.** Where the Owner is required by federal regulations to provide HUD a Design Professional certification regarding the design of the Projects (24 CFR 968.235), the Design Professional shall provide such a certification to the Owner.

**1.5 Retention and Inspection of Records.** Pursuant to 24 CFR 85.26(i)(10) and (11), access shall be given by the Design Professional to the Owner, HUD, the Comptroller General of the United States, or any of their duly authorized representatives, to any books, documents, papers, and records of the Design Professional which are directly pertinent to that specific Contract for the purpose of making an audit, examination, excerpts, and transcriptions. All required records shall be retained for three years after the Owner or Design Professional and other subgrantees make final payments and all other pending matters are closed.

**1.6 Copyrights and Rights in Data.** HUD has no regulations pertaining to copyrights or rights in data as provided in 24 CFR 85.36. HUD requirements, Article 45 of the General Conditions to the Contract for Construction (form HUD-5370) requires that contractors pay all royalties and license fees. All drawings and specifications prepared by the Design Professional pursuant to this contract will identify any applicable patents to enable the general contractor to fulfill the requirements of the construction contract.

**1.7 Conflicts of Interest.** Based in part on federal regulations (24 CFR 85.36(b)) and Contract agreement between the Owner and HUD, no employee, officer, or agent of the Owner (HUD grantee) shall participate in selection, or in the award or administration of a contract supported by Federal funds if a conflict of interest, real or apparent, would be involved.

Such a conflict would arise when:

- (i) The employee, officer or agent,
- (ii) Any member of his or her immediate family,
- (iii) His or her partner, or
- (iv) An organization that employs, or is about to employ, any of the above, has a financial or other interest in the firm selected for award. The grantee's or subgrantee's officers, employees or agents will neither solicit nor accept gratuities, favors or anything of monetary value from Contractors, or parties to sub-agreements. Grantees and subgrantees may set minimum rules where the financial interest is not substantial or the gift is an unsolicited item of nominal intrinsic value. To the extent permitted by State or local law or regulations, such standards or conduct will provide for penalties, sanctions, or other disciplinary actions for violations of such standards by the grantee's and subgrantee's officers, employees, or agents or by Contractors or their agents. The awarding agency may in regulation provide additional prohibitions relative to real, apparent, or potential conflicts of interest.

Neither the Owner nor any of its contractors or their subcontractors shall enter into any Contract, subcontract, or agreement, in connection with any Project or any property included or planned to be included in any Project, in which any member, officer, or employee of the Owner, or any member of the governing body of the locality in which the Project is situated, or any member of the governing body of the locality in which the Owner was activated, or in any other public official of such locality or localities who exercises any responsibilities or functions with respect to the Project during his/her tenure or for one year thereafter has any interest, direct or indirect. If any such present or former member, officer, or employee of the Owner, or any such governing body member or such other public official of such locality or localities involuntarily acquires or had acquired prior to the beginning of his/her tenure any such interest, and if such interest is immediately disclosed to the Owner and such disclosure is entered upon the minutes of the Owner, the Owner, with the prior approval of the Government, may waive the prohibition contained in this subsection: Provided, That any such present member, officer, or employee of the Owner shall not participate in any action by the Owner relating to such contract, subcontract, or

**Housing and Urban Development**

No member, officer, or employee of the Owner, no member of the governing body of the locality in which the project is situated, no member of the governing body of the locality in which the Owner was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the project, during his/her tenure or for one year thereafter, shall have any interest, direct or indirect, in this contract or the proceeds thereof.

**1.8 Disputes.** In part because of HUD regulations (24 CFR 85.36(i)(1)), this Design Professional Agreement, unless it is a small purchase contract, has administrative, contractual, or legal remedies for instances where the Design Professional violates or breaches Agreement terms, and provide for such sanctions and penalties as may be appropriate.

**1.9 Termination.** In part because of HUD regulations (24 CFR 85.36(i)(2)), this Design Professional Agreement, unless it is for an amount of \$10,000 or less, has requirements regarding termination by the Owner when for cause or convenience. These include the manner by which the termination will be effected and basis for settlement.

**1.10 Interest of Members of Congress.** Because of Contract agreement between the Owner and HUD, no member of or delegate to the Congress of the United States of America or Resident Commissioner shall be admitted to any share or part of this Contract or to any benefit to arise from it.

**1.11 Limitation of Payments to Influence Certain Federal Transaction.** The Limitation on Use of Appropriated Funds to Influence Certain Federal Contracting and Financial Transactions Act, Section 1352 of Title 31 U.S.C., provides in part that no appropriated funds may be expended by recipient of a federal contract, grant, loan, or cooperative agreement to pay any person, including the Design Professional, for influencing or attempting to influence an officer or employee of Congress in connection with any of the following covered Federal actions: the awarding of any federal contract, the making of any Federal grant, the making of any federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative agreement.

**1.12 Employment, Training, and Contracting Opportunities for Low-Income Persons, Section 3 of the Housing and Urban Development Act of 1968.**

A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent

feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.

B. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.

C. The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.

D. The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR part 135. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR part 135.

E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulations of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.

F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.

G. Reserved.

H. Reserved.

1.13 Reserved.

**1.14 Clean Air and Water.** (Applicable to contracts in excess of \$100,000). Because of 24 CFR 85.36(i)(12) and federal law, the

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1.15 Energy Efficiency. Pursuant to Federal regulations (24 C.F.R 85.36(i)(13)) and Federal law, except when working on an Indian housing authority Project on an Indian reservation, the Design Professional shall comply with the mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163 codified at 42 U.S.C.A. § 6321 et. seq.).

1.16 Prevailing Wages. In accordance with Section 12 of the U.S. Housing Act of 1937 (42 U.S.C. 1437j) the Design Professional shall pay not less than the wages prevailing in the locality, as determined by or adopted (subsequent to a determination under applicable State or local law) by the Secretary of HUD, to all architects, technical engineers, draftsmen, and technicians.

1.17 Non-applicability of Fair Housing Requirements in Indian Housing Authority Contracts. Pursuant to 24 CFR section 905.115(b) title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d-2000d-4), which prohibits discrimination on the basis of race, color or national origin in federally assisted programs, and the Fair Housing Act (42 U.S.C. 3601-3620), which prohibits discrimination based on race, color, religion, sex , national origin, handicap, or familial status in the sale or rental of housing do not apply to Indian Housing Authorities established by exercise of a Tribe's powers of self-government.

1.18 Prohibition Against Liens. The Design professional is Prohibited from placing a lien on the Owner's property. This prohibition shall be placed in all design professional subcontracts.

Design Professional shall comply with applicable standards, orders, or requirements issued under section 306 of the Clean Air Act (42 U.S.C. § 1857h-4 transferred to 42 USC § 7607, section 508 of the Clean Water Act (33 U.S.C. § 1368), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR part 15), on all contracts, subcontracts, and subgrants of amounts in excess of \$100,000.

General Decision Number: OR140016 01/03/2014 OR16

Superseded General Decision Number: OR20130016

State: Oregon

Construction Type: Residential

County: Marion County in Oregon.

RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories).

Modification Number      Publication Date  
0                          01/03/2014

BROR0001-013 06/01/2013

	Rates	Fringes
BRICKLAYER.....\$ 32.75		16.15
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* CARP0001-021 07/01/2013		

	Rates	Fringes
Carpenters:		
Multi Unit.....\$ 24.84		10.86
Single Unit.....\$ 22.34		10.86
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ELEC0280-008 07/01/2013

	Rates	Fringes
ELECTRICIAN.....\$ 27.73		12.83
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ENGI0701-019 01/01/2013		

	Rates	Fringes
Power equipment operators:		
GROUP 1.....\$ 37.63		13.55
GROUP 1A.....\$ 39.51		13.55
GROUP 1B.....\$ 41.39		13.55
GROUP 2.....\$ 35.97		13.55
GROUP 3.....\$ 34.96		13.55
GROUP 4.....\$ 34.00		13.55
GROUP 5.....\$ 32.88		13.55
GROUP 6.....\$ 29.84		13.55

#### POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: CRANE: Helicopter Operator, when used in erecting work; Whirley Operator, 90 ton and over; LATTICE BOOM CRANE: Operator 200 tons through 299 tons, and/or over 200 feet boom; HYDRAULIC CRANE: Hydraulic Crane Operator 90 tons through 199 tons with luffing or tower attachments

GROUP 1A: HYDRAULIC CRANE: Hydraulic Operator, 200 tons and over (with luffing or tower attachment); LATTICE BOOM CRANE: Operator, 200 tons through 299 tons, with over 200 feet boom;

GROUP 1B: LATTICE BOOM CRANE: Operator, 300 tons through 399 tons with over 200 feet boom; Operator 400 tons and over

GROUP 2: CRANE: Cableway Operator, 25 tons and over; HYDRAULIC CRANE: Hydraulic crane operator 90 tons through 199 tons (without luffing or tower attachment); TOWER/WHIRLEY OPERATOR: Tower Crane Operator; Whirley Operator, under 90 tons; LATTICE BOOM CRANE: 90 through 199 tons and/or 150 to 200 feet boom; EXCAVATOR: Excavator over 130,000 lbs.; HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (with luffing or tower attachment); BLADE: Auto Grader; Blade Operator-Robotic; Rubber tired scraper with tandem scrapers, multi-engine

GROUP 3: HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (without luffing or tower attachment); LATTICE BOOM CRANES: Lattice Boom Crane-50 through 89 tons (and less than 150 feet boom); EXCAVATOR: excavator over 80,000 lbs. through 130,000 lbs.; Rubber Tired Scraper: with tandem scrapers; self loading, paddle wheel, auger type, finish and/or 2 or more units.

GROUP 4: CRANE: Hydraulic Crane Operator, under 50 tons; LATTICE BOOM CRANE OPERATOR: Lattice Boom Crane Operator, under 50 tons; TRACKHOE/ EXCAVATOR-ROBOTIC: up to and including 20,0000 lbs. with any or all attachments; Excavator Operator over 20,000 lbs through 80,000 lbs.; BLADE: Blade operator; Tractor operator with boom attachment; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator over 20,000 lbs pullback; CRANE: Chicago boom and similar types; Boom type lifting device, 5 ton capacity or less; HYDRAULIC HOES EXCAVATOR: Robotic Hydraulic backhoe operator, track and wheel type up to and including 20,0000 lbs. with any or all attachments; Asphalt Paver; Scree Operator; Rubber-Tired Scraper, single engine, single scraper.

GROUP 5: TRACKHOE/EXCAVATORS-HYDRAULIC: up to and including 20,000 lbs.; Boom truck operator; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator less than 20,000 lbs pullback; HYDRAULIC HOES EXCAVATORS: Hydraulic Backhoe Operator, wheel type (Ford, John Deere, Case type); Hydraulic Backhoe Operator track type up to and including 20,000 lbs.; Concrete Pumper; Concrete Paver

GROUP 6: LOADERS: (less than 1 cu yd.); Roller (Non-Asphalt); Oiler

Zone Differential (add to Zone 1 rates):

Zone 2 - \$3.00

Zone 3 - \$6.00

For the following metropolitan counties: MULTNOMAH; CLACKAMAS; MARION; WASHINGTON; YAMHILL; AND COLUMBIA; CLARK; AND COWLITZ COUNTY, WASHINGTON WITH MODIFICATIONS AS

INDICATED:

All jobs or projects located in Multnomah, Clackamas and Marion Counties, West of the western boundary of Mt. Hood National Forest and West of Mile Post 30 on Interstate 84 and West of Mile Post 30 on State Highway 26 and West of Mile Post 30 on Highway 22 and all jobs or projects located in Yamhill County, Washington County and Columbia County and all jobs or projects located in Clark & Cowlitz County, Washington except that portion of Cowlitz County in the Mt. St. Helens "Blast Zone" shall receive Zone I pay for all classifications.

All jobs or projects located in the area outside the identified boundary above, but less than 50 miles from the Portland City Hall shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the Portland City Hall, but outside the identified border above, shall receive Zone III pay for all classifications.

For the following cities: ALBANY; BEND; COOS BAY; EUGENE; GRANTS PASS; KLAMATH FALLS; MEDFORD; ROSEBURG

All jobs or projects located within 30 miles of the respective city hall of the above mentioned cities shall receive Zone I pay for all classifications.

All jobs or projects located more than 30 miles and less than 50 miles from the respective city hall of the above mentioned cities shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the respective city hall of the above mentioned cities shall receive Zone III pay for all classifications.

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LABO0001-031 06/01/2013

Rates	Fringes
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Laborers: (Mason Tender-Brick) ...\$ 27.63	12.85
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LABO0003-005 06/01/2013

Rates	Fringes
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Laborers:	
GROUP 2.....\$ 27.09	12.85
GROUP 3.....\$ 22.57	12.85

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LABORER CLASSIFICATIONS:

GROUP 2: Grade Checker; Pipelayers

GROUP 3: Traffic Flaggers

\* PAIN0055-022 07/01/2013

	Rates	Fringes
<b>Painters:</b>		
BRUSH, ROLLER AND SPRAY.....\$ 18.59		8.83
<hr/>		
PLAS0555-003 06/01/2012		
	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...\$ 29.98		17.76
<hr/>		
PLUM0290-004 04/01/2013		
	Rates	Fringes
Plumbers.....\$ 25.40		20.52
<hr/>		
SUOR2009-014 10/16/2009		
	Rates	Fringes
LABORER: Common or General.....\$ 16.44		7.14
LABORER: Mason Tender - Cement/Concrete.....\$ 22.18		7.40
ROOFER.....\$ 12.00		0.00
TRUCK DRIVER: Dump Truck.....\$ 16.91		0.00
TRUCK DRIVER: Water Truck.....\$ 17.00		5.95
<hr/>		

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

=====

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

#### Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

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#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations  
Wage and Hour Division  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board  
U.S. Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

=====

END OF GENERAL DECISION

General Decision Number: OR140028 01/03/2014 OR28

Superseded General Decision Number: OR20130028

State: Oregon

Construction Type: Building

County: Marion County in Oregon.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/03/2014

BROR0001-019 06/01/2013

	Rates	Fringes
BRICKLAYER.....	\$ 32.75	16.15
TILE FINISHER.....	\$ 21.82	11.02
TILE SETTER.....	\$ 29.19	14.64

CARP0001-027 06/01/2012

	Rates	Fringes
Carpenters:		
Metal stud installation and form work only.....	\$ 32.61	14.44

CARP9001-004 06/01/2012

	Rates	Fringes
Acoustical Ceiling Installer & Drywall Hanger.....	\$ 32.90	14.44

ELEC0280-010 07/01/2013

	Rates	Fringes
ELECTRICIAN.....	\$ 37.16	16.44

ELEC0280-015 07/01/2013

	Rates	Fringes
ELECTRICIAN (Alarm Installation, HVAC Electrical and Temperature control wiring and Low Voltage wiring only).....	\$ 27.14	12.46

ENGI0701-024 01/01/2013

	Rates	Fringes
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Power equipment operators:

GROUP 1.....	\$ 37.63	13.55
GROUP 1A.....	\$ 39.51	13.55
GROUP 1B.....	\$ 41.39	13.55
GROUP 2.....	\$ 35.97	13.55
GROUP 3.....	\$ 34.96	13.55
GROUP 4.....	\$ 34.00	13.55
GROUP 5.....	\$ 32.88	13.55
GROUP 6.....	\$ 29.84	13.55

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: CRANE: Helicopter Operator, when used in erecting work; Whirley Operator, 90 ton and over; LATTICE BOOM CRANE: Operator 200 tons through 299 tons, and/or over 200 feet boom; HYDRAULIC CRANE: Hydraulic Crane Operator 90 tons through 199 tons with luffing or tower attachments

GROUP 1A: HYDRAULIC CRANE: Hydraulic Operator, 200 tons and over (with luffing or tower attachment); LATTICE BOOM CRANE: Operator, 200 tons through 299 tons, with over 200 feet boom;

GROUP 1B: LATTICE BOOM CRANE: Operator, 300 tons through 399 tons with over 200 feet boom; Operator 400 tons and over

GROUP 2: CRANE: Cableway Operator, 25 tons and over; HYDRAULIC CRANE: Hydraulic crane operator 90 tons through 199 tons (without luffing or tower attachment); TOWER/WHIRLEY OPERATOR: Tower Crane Operator; Whirley Operator, under 90 tons; LATTICE BOOM CRANE: 90 through 199 tons and/or 150 to 200 feet boom; HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (with luffing or tower attachment); BLADE: Auto Grader; Blade Operator-Robotic; Rubber tired scraper with tandem scrapers, multi-engineTrenching Machine-Wheel Operator; Excavator over 130,000 lbs

GROUP 3: HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (without luffing or tower attachment); LATTICE BOOM CRANES: Lattice Boom Crane-50 through 89 tons (and less than 150 feet boom); Rubber Tired Scraper: with tandem scrapers; self loading, paddle wheel, auger type, finish and/or 2 or more units; Excavator over 80,000 through 130,000 lbs

GROUP 4: CRANE: Hydraulic Crane Operator, under 50 tons; LATTICE BOOM CRANE OPERATOR: Lattice Boom Crane Operator, under 50 tons; TRACKHOE/EXCAVATOR-ROBOTIC: up to and including 20,0000 lbs. with any or all attachments; Excavator Operator over 20,000 lbs through 80,000 lbs.; BLADE: Blade operator; Tractor operator with boom attachment; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator over 20,000 lbs pullback; CRANE: Chicago boom and similar types; Boom type lifting device, 5 ton capacity or less; Asphalt Paver; Screed Operator; Rubber-Tired Scraper, single engine, single scraper; Compactor-Self Propelled; Trenching Machine, digging capacity over 3 ft Depth; Excavator over

20,000 lbs through 80,000 lbs.

GROUP 5: TRACKHOE/EXCAVATOR-HYDRAULIC: up to and including 20,000 lbs.; Boom truck operator; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator less than 20,000 lbs pullback; Concrete Pumper; Concrete Paver: Compactor; forklift over 5 ton.

GROUP 6: LOADERS: (less than 1 cu yd.); Roller (Non-Asphalt); Oiler; Bobcat/Skid Loader; Grade Checker; Crane oiler; forklift

Zone Differential (add to Zone 1 rates):

Zone 2 - \$3.00

Zone 3 - \$6.00

For the following metropolitan counties: MULTNOMAH; CLACKAMAS; MARION; WASHINGTON; YAMHILL; AND COLUMBIA; CLARK; AND COWLITZ COUNTY, WASHINGTON WITH MODIFICATIONS AS INDICATED:

All jobs or projects located in Multnomah, Clackamas and Marion Counties, West of the western boundary of Mt. Hood National Forest and West of Mile Post 30 on Interstate 84 and West of Mile Post 30 on State Highway 26 and West of Mile Post 30 on Highway 22 and all jobs or projects located in Yamhill County, Washington County and Columbia County and all jobs or porjects located in Clark & Cowlitz County, Washington except that portion of Cowlitz County in the Mt. St. Helens "Blast Zone" shall receive Zone I pay for all classifications.

All jobs or projects located in the area outside the identified boundary above, but less than 50 miles from the Portland City Hall shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the Portland City Hall, but outside the identified border above, shall receive Zone III pay for all classifications.

For the following cities: ALBANY; BEND; COOS BAY; EUGENE; GRANTS PASS; KLAMATH FALLS; MEDFORD; ROSEBURG

All jobs or projects located within 30 miles of the respective city hall of the above mentioned cities shall receive Zone I pay for all classifications.

All jobs or projects located more than 30 miles and less than 50 miles from the respective city hall of the above mentioned cities shall receive Zone II pay for all classifications.

All jobs or projects located more than 50 miles from the respective city hall of the above mentioned cities shall receive Zone III pay for all classifications.

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IRON0029-011 07/01/2013

Rates Fringes

IRONWORKER (Ornamental,  
Reinforcing, and Structural).....\$ 34.12 21.35

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LABO0001-030 09/01/2013

Rates Fringes

Laborers: (Mason  
Tender-Cement/Concrete).....\$ 27.63 12.85

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LABO0001-031 06/01/2013

Rates Fringes

Laborers: (Mason Tender-Brick)...\$ 27.63 12.85

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LABO0001-032 06/01/2013

Rates Fringes

Laborers: (Mason Tender-Stone)...\$ 27.63 12.85

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LABO0003-008 06/01/2013

Rates Fringes

Laborers:  
GROUP 1.....\$ 26.09 12.85  
GROUP 2.....\$ 27.09 12.85

#### LABORER CLASSIFICATIONS

GROUP 1: Form-Stripping, Power Tool Operator

GROUP 2: Vibrating Plate, Grade Checker, Pipelayer

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\* PAIN0055-023 07/01/2013

Rates Fringes

Painters:  
Brush, Roller and Spray.....\$ 21.01 8.83

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PAIN0055-026 08/13/2012

Rates Fringes

DRYWALL FINISHER/TAPER.....\$ 32.22 12.40

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PAIN0740-002 01/01/2013

Rates Fringes

GLAZIER.....\$ 35.80 13.89

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PLAS0082-003 06/01/2011

	Rates	Fringes
PLASTERER.....	\$ 25.08	11.32

PLAS0555-006 06/01/2012

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 29.98	17.76

PLUM0290-008 04/01/2013

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 39.71	22.10

ROOF0049-006 06/01/2012

	Rates	Fringes
Roofers:		
Excluding Metal Roof.....	\$ 23.37	10.85
Single Ply Roof.....	\$ 23.37	10.85

SHEE0016-011 07/01/2013

	Rates	Fringes
Sheet Metal Worker.....	\$ 36.68	16.61

SUOR2009-026 11/09/2009

	Rates	Fringes
CARPENTER, Excludes Acoustical Ceiling Installation, Drywall Hanging, Form Work, and Metal Stud Installation.....	\$ 21.31	6.33
LABORER: Common or General.....	\$ 19.53	7.50
LABORER: Landscape.....	\$ 12.38	0.00
OPERATOR: Backhoe.....	\$ 22.53	5.29
TRUCK DRIVER: Dump Truck.....	\$ 20.32	7.11
TRUCK DRIVER: Water Truck.....	\$ 18.11	5.05

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====  
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(29CFR 5.5 (a) (1) (ii)).

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=====

END OF GENERAL DECISION

**SECTION 01 10 00 – SUMMARY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Coordination with Work by Owner.
7. Delegated Design / Deferred Submittal requirements coordination.
8. Specification and drawing conventions.
9. Interpretation of Contract Documents.
10. Oral Modifications.

- B. Related Section:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

**1.3 PROJECT INFORMATION**

- A. Project Identification: Parkway Village: West.

1. Project Location: 3143-3135 7<sup>th</sup> Place NE, Salem, Oregon 97303.

- B. Owner:

Salem Housing Authority (SHA)  
360 Church Street SE  
Salem, Oregon 97308-0808  
Andy Wilch – [awilch@cityofsalem.net](mailto:awilch@cityofsalem.net)

- C. Owner's Representative:

Housing Development Center (HDC)  
847 NE 19<sup>th</sup> Avenue, Suite 150  
Portland, Oregon 97232  
France Fitzpatrick – [france@housingdevelopmentcenter.org](mailto:france@housingdevelopmentcenter.org)

D. Architect:

Carleton Hart Architecture, PC  
322 NW 8<sup>th</sup> Avenue  
Portland, Oregon 97209  
Devin Follingstad – [devin.follingstad@carletonhart.com](mailto:devin.follingstad@carletonhart.com)

E. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Civil Engineering:

MGH Associates  
104 West 9<sup>th</sup> Street, Suite 207  
Vancouver, Washington 98660  
Bill Brannan – [bill.brannan@mghassociates.com](mailto:bill.brannan@mghassociates.com)

2. Landscape Architecture:

Walker Macy  
111 SW Oak, Suite 200  
Portland, Oregon 97204  
Gary Datka – [gdatka@walkermacy.com](mailto:gdatka@walkermacy.com)

3. Structural Engineering:

TM Rippey Consulting Engineers  
7650 SW Beveland Street, Suite 100  
Tigard, Oregon 97223  
Doug Gannett – [dgannett@tmrippey.com](mailto:dgannett@tmrippey.com)

4. Mechanical / Electrical (Design Assist):

MKE & Associates, Inc.  
6915 SW Macadam Avenue, Suite 200  
Portland, Oregon 97219  
Rick Dusa – [rickd@mke-inc.com](mailto:rickd@mke-inc.com)

5. Building Enclosure:

Richard Graves Waterproofing Consultant, LLC  
PO Box 13743  
Portland, Oregon 97213  
Richard Graves – [richard@rgravesarchitect.com](mailto:richard@rgravesarchitect.com)

F. Owner Consultants: The Owner has retained the following design professionals who have provided professional advisement for the Contract Documents:

1. Survey:

Multi / Tech Engineering Services, Inc.  
1155 13<sup>th</sup> Street SE  
Salem, Oregon 97302  
(503) 363-9227

Survey Consultant may advise on the following portions of the Contract Documents:

- a. General land surveying.
- b. Meets and bounds.

2. Geotechnical:

Carlson Geotechnical, A Division of Carlson Testing, Inc.  
PO Box 23814  
Tigard, Oregon 97281  
Jeff Jones – [jjones@carlsontesting.com](mailto:jjones@carlsontesting.com)

Geotechnical Consultant has provided the following Work:

- a. Field investigation
- b. Laboratory testing
- c. Provide written report

3. Water Testing:

Qualified Envelope Diagnostics, Inc. (QED)  
2206-3 NW Birdsdale Avenue  
Gresham, Oregon 970303  
Charlie Klinger – [charlie@qedlab.com](mailto:charlie@qedlab.com)

Water Testing Consultant has provided the following Work:

- a. Onsite field mock-up testing
- b. Onsite field in place testing
- c. Provide written reports

4. Microbial Growth / Moisture Damage Investigation:

Hahn and Associates, Inc.  
434 NW 6<sup>th</sup> Avenue, Suite 203  
Portland, Oregon 97209-3651  
Nora Eskes – [norae@hahnenv.com](mailto:norae@hahnenv.com)

Microbial Growth / Moisture Damage Consultant has provided the following Work:

- a. Field investigation
- b. Provide written report

G. Contractor:

1. LMC Construction:

19200 SW Teton Avenue  
Tualatin, Oregon 97062  
Ryan Duffin – [ryand@lmcin incorporated.com](mailto:ryand@lmcin incorporated.com)

H. Government (Agency):

1. Oregon Housing and Community Services (OHCS)

North Mall Office Building  
725 Summer Street NE, Suite B  
Salem, Oregon 97301-1266

I. Design-Builder:

- 1. Design-Builder has been engaged for this Project to provide mechanical, electrical, and plumbing engineering services. The terms "Design-Builder" and "Contractor" are synonymous.

**1.4 WORK COVERED BY CONTRACT DOCUMENT**

- A. The Work of the Project is defined by the Contract Documents and consists of the following:
1. Site work: Site re-grading to direct surface flow away from buildings. Catch basins and area drains upgraded to current DEQ standards. Replacement of damaged existing landscape and irrigation. Replacement of existing landscaping where demolition is required for foundation and drainage repair. Removal and replacement of all site walkways. Accessible improvements to walks and parking. New accessible route through site.
  2. Exterior work: New roofing, gutters and downspouts, wall sheathing, siding, windows, and doors at all buildings. Partial replacement of roof sheathing. Partial replacement of exterior wall framing and cavity insulation. Replacement of exterior decks and deck rails.
  3. Interior work: Allowance for floor sheathing replacement in all ground floor units. Replacement of ground floor gypsum wall board at areas requiring new work. Replacement of floor finishes and cabinets at all ground floor units. Replacement of exhaust fans at all bathrooms and laundry areas. New lint traps at all dryers. Partial replacement of appliances at select units.
  4. Project to comply with OHCS ‘Green Path’ for rehabilitation projects with 25 or more dwelling units building requirements.

B. Type of Contract:

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

**1.5 WORK BY OWNER**

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.
- B. Concurrent Work: Owner will perform the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract, and is to be coordinated by the Contractor.
1. None

**1.6 OWNER’S DUTIES**

- A. Pay for plan check and building permit fees. Building permit fees include those fees assessed by the City of Salem, Oregon at time of issuance of the primary building permit and additional submittal fees for deferred submittals. Additional permit fees for items such as mechanical, electrical, and plumbing systems, roof trusses, firestopping and other “Z” permits are the responsibilities of the Contractor.
- B. Pay for utility connection (hook-up) fees, including water meters. Owner is responsible for connection fees only. Contractor is responsible for coordination, labor and materials to complete utility connection, whether completed by Contractor’s forces or City personnel.

- C. Pay for independent inspections and on-site testing required by ordinance and specifications. This does not include testing and inspections required at off-site locations during material design or production. These services may include but are not limited to:
  - 1. Construction testing/inspection
    - a. Soils
    - b. Materials
    - c. Concrete
    - d. Segmental Retaining Wall Units
    - e. Adhesive anchors
  - 2. Field testing of installed windows for verification of compliance with specified requirements.
- D. Pay for printing plans and specifications as required for plan check. Pay for (1) one full size copy of the plans and specifications for the contractor's use for bidding and construction. Additional sets will be at the contractor's expense.

#### 1.7 CONTRACTOR'S DUTIES

- A. Provide and pay for labor, materials, tools, equipment, supervision, administration, temporary facilities and services necessary for proper execution and completion of the Work.
- B. Provide and pay for all temporary utilities necessary for proper execution and completion of the Work.
- C. Pay legally required sales, consumer and use taxes.
- D. Coordinate and arrange for site inspections by local building agency and Owner's testing agency.
- E. Coordinate and arrange for utility service connections. Coordinate all work performed by City/County work force within public right-of-way. Pay for required labor and materials beyond standard connection fee.
- F. Coordinate and pay for all other required permits, governmental fees and licenses not specifically listed as Owner's responsibility.
- G. Arrange and pay for all work required in the right-of-way, including work to be performed by City work force.
- H. Trade permits and fees for items such as mechanical, electrical, fire sprinklers, plumbing systems, roof trusses and firestopping and other "Z" permits are the responsibilities of the Contractor. Coordinate deferred submittals with local jurisdiction's requirements.

#### 1.8 DELEGATED DESIGN / DEFERRED SUBMITTAL REQUIREMENTS

- A. General: Portions of this contract will be delivered through a Delegated Design and / or Deferred Submittal process with selected subcontractors. Refer to Division 01, Section "Delegated Design and Deferred Submittal Requirements" and Drawings and Specifications for specific requirements.

**1.9 ACCESS TO SITE**

- A. General: Contractor shall have full use of Phase 1 of the Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

**1.10 COORDINATION WITH OCCUPANTS**

- A. Full Owner Occupancy: Owner will occupy site, existing, and adjacent building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits and egress paths unless otherwise indicated.
  - 1. Maintain access to existing walkways and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approvals of Authorities Having Jurisdiction (AHJ).
  - 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

**1.11 WORK RESTRICTIONS**

- A. Work Restrictions, General: Comply with restrictions on construction operations.
  - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 6 p.m., Monday through Saturday, except as otherwise indicated or limited by local jurisdiction.
- C. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor air intakes.
- D. Controlled Substances: Use of tobacco products and other controlled substances on the Project site is not permitted.
- E. Employee Identification: Provide identification tags for Contractor personnel working on the Project site. Require personnel to utilize identification tags at all times.
- F. Employee Screening: Comply with Owner's requirements regarding drug and background screening of Contractor personnel working on the Project site.
  - 1. Maintain list of approved screened personnel with Owner's Representative.

**1.12 SPECIFICATION AND DRAWING CONVENTIONS**

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

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

#### 1.13 INTERPRETATION OF CONTRACT DOCUMENTS

- A. Should the Contractor find discrepancies in, or omissions from the Drawings and Specifications, or should the Contractor be in doubt as to their meaning, the Contractor shall promptly notify the Owner and Architect and should it be found that the point in question is not clearly and fully set forth, a written clarification will be issued. Neither the Owner nor the Architect shall be responsible for any oral instructions.

#### 1.14 ORAL MODIFICATIONS

- A. It shall be distinctly understood that no oral statement of any person shall be allowed in any manner to modify any of the Contract provisions. Changes shall be made only on written authorization of the Owner and / or Architect, except in an emergency endangering life or property.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

**SECTION 01 21 00 – ALLOWANCES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements governing allowances.

- 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

- B. Types of allowances include the following:

- 1. Lump-sum allowances.
  - 2. Unit-cost allowances.
  - 3. Quantity allowances.
  - 4. Contingency allowances.
  - 5. Testing and inspecting allowances.

- C. Related Requirements:

- 1. Division 01, Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

**1.3 SELECTION AND PURCHASE**

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

**1.4 SUBMITTALS**

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- D. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

#### 1.5 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

#### 1.6 LUMP-SUM, UNIT-COST AND QUANTITY ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

#### 1.7 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

**1.8 TESTING AND INSPECTING ALLOWANCES**

- A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.
- B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.
- C. Costs of services not required by the Contract Documents are not included in the allowance.
- D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

**1.9 ADJUSTMENT OF ALLOWANCES**

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
  - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
  - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
  - 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
  - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
  - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
  - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

### 3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

### 3.3 SCHEDULE OF ALLOWANCES

1. Temporary weather protection.
2. Mold remediation.
3. Site rails. Parkway West only.
4. Remove and replace fascia.
5. Roof sheathing. Assumes 15% remove and replace.
6. Floor sheathing. Assumes 50% remove/replace at all ground floor units.
7. Dry-rot repairs.
8. Fire sprinkler soffits.
9. Wall insulation – remove and replace selected wall insulation required for mold remediation.
10. Attic insulation.
11. Floor insulation – Remove and replace selected floor insulation required for structural repairs.
12. Unit millwork, replacement of selected millwork for structural repairs.
13. Attic draft-stop repairs to existing attic draft stops.
14. Dry wall repairs for mold remediation, MEP upgrades and dry-rot repairs.
15. Floor preparation.
16. ADA (accessible) appliance replacement.
17. Select crawl space plumbing repairs.
18. Select building mounted wiring to be buried within the existing wall cavity.
19. Interior light bulb replacement. Replace all incandescent bulbs with new screw-in CFL.
20. Landscaping.
21. Asphalt repairs.

END OF SECTION 01 21 00

**SECTION 01 25 00 - SUBSTITUTION PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for substitutions.

**B. Related Requirements:**

1. Division 01, Section "Allowances" for products selected under an allowance.
2. Division 01, Section "Alternates" for products selected under an alternate.
3. Division 01, Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

**1.3 DEFINITIONS**

- A. Substitutions: Contractor proposals for changes in products, materials, equipment, and methods of construction required by the Contract Documents made during bidding and negotiation, 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.

**1.4 CONTRACTOR'S RESPONSIBILITY**

- 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 which subsequently become apparent which are related to substitutions.

## 1.5 SUBMITTALS

- A. Substitution Requests: Submit three (3) copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use CSI Form 13.1A.
  2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Cost information, including a proposal of change, if any, in the Contract Sum.
    - g. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
    - h. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
  3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 10 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
    - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
    - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## 1.6      QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

## 1.7      PROCEDURES

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

# PART 2 - PRODUCTS

## 2.1      SUBSTITUTIONS

- A. Substitutions During Bidding: Submit requests for substitution not later than ten (10) days prior to Bid Date, unless a longer time frame is otherwise stipulated in the Instructions to Bidders.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- b. Requested substitution provides sustainable design characteristics that specified product provided for achieving OHCS prerequisites and credits.
- c. Substitution request is fully documented and properly submitted.
- d. Requested substitution will not adversely affect Contractor's construction schedule.
- e. Requested substitution has received necessary approvals of authorities having jurisdiction.
- f. Requested substitution is compatible with other portions of the Work.
- g. Requested substitution has been coordinated with other portions of the Work.
- h. Requested substitution provides specified warranty.
- i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions After Award of Contract:

1. Substitutions will normally not be considered after award of Contract, except due to unforeseen circumstances.
2. 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.

- a. The specified product cannot be provided within the Contract time.
    - 1) 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.
  - b. The specified product cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
  - c. The specified product cannot be coordinated with other materials and the Contractor certifies that the proposed substitution can be coordinated.
  - d. The specified product cannot provide the required warranty and the Contractor certifies that the proposed substitution provides the warranty.
  - e. 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.
3. 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.

C. Substitutions Not Permitted:

- 1. Substitutions indicated or implied on submitted Shop Drawings or Product Data without first requesting approval in accordance with requirements of this Section.
- 2. Where manufacturers, products, or systems listed in the Specifications are not followed with "or approved" or "Substitutions: Provide in accordance with requirements of Section Product Substitution Procedures," it is intended that substitutions are not permitted.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

**SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
  1. Division 01, Section "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

**1.3 MINOR CHANGES IN THE WORK**

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions." If adjustments to the Contract Sum or Contract Time will result from issued ASI, Contractor to prepare Proposal Request describing changes in Contract Sum or Contact Time for Owner approval. If ASI requires additional Contract Sum or Contract Time do not proceed with Work until Proposal Request is approved by Owner.

**1.4 PROPOSAL REQUESTS**

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
  2. Within ten (10) days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.

- d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  - e. Quotation Form: Use CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail" or forms acceptable to Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect. Proposals must be initiated within 20 days of discovery of latent or changed condition.
- 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - 4. Include costs of labor and supervision directly attributable to the change.
  - 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  - 6. Comply with requirements in Division 01, Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
  - 7. Proposal Request Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail" or forms acceptable to Architect.

## 1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Division 01, Section "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Division 01, Section "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

## 1.6 CHANGE ORDER PROCEDURES

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

**1.7 CONSTRUCTION CHANGE DIRECTIVE**

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

**SECTION 01 29 00 - PAYMENT PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
  - 1. Division 01, Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Division 01, Section "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
  - 3. Division 01, Section "Submittal Procedures" for administrative requirements governing the preparation and submittal of the submittal schedule.

**1.3 DEFINITIONS**

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

**1.4 SCHEDULE OF VALUES**

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
  - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with continuation sheets.
    - b. Submittal schedule.
    - c. 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 seven (7) days before the date scheduled for submittal of initial Applications for Payment.

3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments; provide subschedules showing values correlated with each phase of payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
  1. Identification: Include the following Project identification on the schedule of values:
    - a. Project name and location.
    - b. Name of 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. 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 of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
      - 1) Labor.
      - 2) Materials.
      - 3) Equipment.
  3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five (5) percent of the Contract Sum.
  4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
  5. Provide a separate line item in the schedule of values 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. If required, include evidence of insurance.
  6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

- 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 in the schedule of values or as general conditions expense, at Contractor's option.
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 in the schedule of values or distributed as general overhead expense, at Contractor's option.
8. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor (closest to the 25<sup>th</sup> of each month). The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
  1. Submit draft copy of Application for Payment seven (7) days prior to due date for review by Architect.(3 days prior to the progress meeting at which the final application will be presented)
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
  2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
  3. Provide summary documentation for stored materials indicating the following:
    - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
    - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
    - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments as indicated in the Agreement between Owner and Contractor.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, as indicated in the Agreement between the Owner and Contractor, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  2. When an application shows completion of an item, submit conditional final or full waivers.
  3. 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 conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
  5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
  2. Schedule of values.
  3. Contractor's construction schedule (preliminary if not final).
  4. Products list (preliminary if not final).
  5. Schedule of unit prices.
  6. Submittal schedule (preliminary if not final).
  7. List of Contractor's staff assignments.
  8. List of Contractor's principal consultants.
  9. Copies of building permits.

10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  11. Initial progress report.
  12. Report of preconstruction conference.
  13. Certificates of insurance and insurance policies.
  14. Performance and payment bonds.
  15. Data needed to acquire Owner's insurance.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
  2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  3. Updated final statement, accounting for final changes to the Contract Sum.
  4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  6. AIA Document G707, "Consent of Surety to Final Payment."
  7. Evidence that claims have been settled.
  8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  9. Final liquidated damages settlement statement.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION (Not Used)**

END OF SECTION 01 29 00

**SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

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

1. General coordination procedures.
2. Coordination drawings.
3. Requests for Information (RFIs).
4. Project meetings.

- B. Related Sections include the following:

1. Division 01, Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Division 01, Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Division 01, Section "Construction Waste Management Disposal" for handling requirements of construction waste.
4. Division 01, Section "Closeout Procedures" for coordinating closeout of the Contract..

**1.3 DEFINITIONS**

- A. RFI: Request from Contractor seeking information required by or clarifications of the Contract Documents.

**1.4 SUBMITTALS**

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. or approved form. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

- B. Key Personnel Names: Within fifteen (15) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

## 1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination (sub-contractors): Each sub-contractor shall cooperate and participate in the coordination of its construction operations with those of other sub-contractors and entities to ensure efficient and orderly installation of each part of the Work. Each sub-contractor shall cooperate and participate in the coordination of its operations with operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components with other sub-contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
  2. Preparation of the schedule of values.

3. Installation and removal of temporary facilities and controls.
  4. Delivery and processing of submittals.
  5. Progress meetings.
  6. Preinstallation conferences.
  7. Project closeout activities.
  8. Startup and adjustment of systems.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

## 1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity and as required to obtain trade permits.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    2. Mechanical and Plumbing Work: Show the following:
      - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
      - b. Fire-rated enclosures around ductwork.
    3. Electrical Work: Show the following:
      - a. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    4. Fire-Protection System: Show the following:
      - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
  5. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
  6. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Division 01, Section "Submittal Procedures."

### 1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
  - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
  - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
  - 1. Project name.
  - 2. Project number.
  - 3. Date.
  - 4. Name of Contractor.
  - 5. Name of Architect
  - 6. RFI number, numbered sequentially.
  - 7. RFI subject.
  - 8. Specification Section number and title and related paragraphs, as appropriate.
  - 9. Drawing number and detail references, as appropriate.
  - 10. Field dimensions and conditions, as appropriate.
  - 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  - 12. Contractor's signature.
  - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716 or software-generated form with substantially the same content as indicated above, acceptable to Architect.
  - 1. Attachments may be electronic files in Adobe Acrobat PDF format if approved by the Architect.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven (7) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
  - 1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.

- f. Requests for interpretation of Architect's actions on submittals.
  - g. Incomplete RFIs or inaccurately prepared RFIs.
2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
  3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within ten (10) days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use CSI Log Form 13.2B or approved form or Software with not less than the following:
1. Project name.
  2. Name and address of Contractor.
  3. Name and address of Architect.
  4. RFI number including RFIs that were returned without action or withdrawn.
  5. RFI description.
  6. Date the RFI was submitted.
  7. Date Architect's response was received.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven (7) days if Contractor disagrees with response.
1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

## 1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three (3) days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than fifteen days after execution of the Agreement.

1. Conduct the conference to review responsibilities and personnel assignments.
  2. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing.
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Lines of communications.
    - f. Procedures for processing field decisions and Change Orders.
    - g. Procedures for RFIs.
    - h. Procedures for testing and inspecting.
    - i. Procedures for processing Applications for Payment.
    - j. Distribution of the Contract Documents.
    - k. Submittal procedures.
    - l. Sustainable design requirements.
    - m. Preparation of record documents.
    - n. Use of the premises.
    - o. Work restrictions.
    - p. Working hours.
    - q. Owner's occupancy requirements.
    - r. Responsibility for temporary facilities and controls.
    - s. Procedures for moisture and mold control.
    - t. Procedures for disruptions and shutdowns.
    - u. Construction waste management and recycling.
    - v. Parking availability.
    - w. Office, work, and storage areas.
    - x. Equipment deliveries and priorities.
    - y. First aid.
    - z. Security.
    - aa. Progress cleaning.
  4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner of scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.

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

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

- 16) Pending changes.
  - 17) Status of Change Orders.
  - 18) Pending claims and disputes.
  - 19) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

**SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's construction schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.
7. Special reports.

- B. Related Sections include the following:

1. Division 01, Section "Submittal Procedures" for submitting schedules and reports.
2. Division 01, Section "Quality Requirements" for submitting a schedule of tests and inspections.

**1.3 DEFINITIONS**

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

- B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.

- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
  - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
  - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
  - 1. Working electronic copy of schedule file, where indicated.
  - 2. PDF electronic file.
  - 3. Four (4) paper copies.
- B. Startup construction schedule.
  - 1. Approval of startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
  - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- D. Daily Construction Reports: Submit at monthly intervals.
- E. Material Location Reports: Submit at weekly intervals.
- F. Field Condition Reports: Submit at time of discovery of differing conditions.
- G. Special Reports: Submit at time of unusual event.
- H. Qualification Data: For scheduling consultant.

## 1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from entities involved.
  - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

## PART 2 - PRODUCTS

### 2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for Notice to Proceed to date of final completion.
  - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
  - 1. Activity Duration: Define activities so no activity is longer than thirty (30) days, unless specifically allowed by Architect.
  - 2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 01, Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  - 4. Startup and Testing Time: Include no fewer than fifteen (15) days for startup and testing.
  - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
  - 6. Punch List and Final Completion: Include not more than thirty (30) days for completion of punch list items and final completion.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
  - 1. Phasing: Arrange list of activities on schedule by phase.
  - 2. Work under More Than One Contract: Include a separate activity for each contract.
  - 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.

4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date. Delivery dates indicated stipulate the earliest possible delivery date.
  5. Owner-Furnished Products: Include a separate activity for each product. Delivery dates indicated stipulate the earliest possible delivery date.
  6. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services..
    - d. Use of premises restrictions.
    - e. Seasonal variations.
    - f. Environmental control.
  7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
    - a. Subcontract awards.
    - b. Submittals.
    - c. Purchases.
    - d. Fabrication.
    - e. Sample testing.
    - f. Deliveries.
    - g. Installation.
    - h. Tests and inspections.
- A. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- B. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
1. See Division 01, Section "Payment Procedures" for cost reporting and payment procedures.
- C. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
  2. Unanswered Requests for Information.
  3. Rejected or unreturned submittals.
  4. Notations on returned submittals.
  5. Pending modifications affecting the Work and Contract Time.
- D. Recovery Schedule: When periodic update indicates the Work is fourteen (14) or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

E. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

1. Use Microsoft Project for Windows operating system, or approved substitution.

## 2.2 STARTUP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven (7) days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first ninety (90) days of construction. Include skeleton diagram for the remainder of the Work.

## 2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. CPM Schedule: Prepare Contractor's construction schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
  1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60 days after date established for commencement of the Work.
    - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
  2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
  3. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to correlate with Contract Time.
- B. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Prepare a skeleton network to identify probable critical paths.
  1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Mobilization and demobilization.
    - b. Purchase, fabrication, delivery of long-lead materials.
    - c. Installation.
    - d. Testing and commissioning.
    - e. Punch list and final completion.
    - f. Activities occurring following final completion.
  2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.

3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
  4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
    - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- C. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- D. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
  2. Description of activity.
  3. Principal events of activity.
  4. Immediate preceding and succeeding activities.
  5. Early and late start dates.
  6. Early and late finish dates.
  7. Activity duration in workdays.
  8. Total float or slack time.
  9. Average size of workforce.
  10. Dollar value of activity (coordinated with the schedule of values).
- E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
  2. Changes in early and late start dates.
  3. Changes in early and late finish dates.
  4. Changes in activity durations in workdays.
  5. Changes in the critical path.
  6. Changes in total float or slack time.
  7. Changes in the Contract Time.

## 2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
  2. List of separate contractors at Project site.
  3. Approximate count of personnel at Project site.
  4. Equipment at Project site.
  5. Material deliveries.

6. High and low temperatures and general weather conditions, including presence of rain or snow.
  7. Accidents.
  8. Meetings and significant decisions.
  9. Unusual events (see special reports).
  10. Stoppages, delays, shortages, and losses.
  11. Meter readings and similar recordings.
  12. Emergency procedures.
  13. Orders and requests of authorities having jurisdiction.
  14. Change Orders received and implemented.
  15. Construction Change Directives received and implemented.
  16. Services connected and disconnected.
  17. Equipment or system tests and startups.
  18. Partial completions and occupancies.
  19. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.
  2. Material stored prior to previous report and since removed from storage and installed.
  3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## 2.5 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one (1) day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

**PART 3 - EXECUTION****3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
  1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
  1. Post copies in Project meeting rooms and temporary field offices.
  2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

**SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs..

- B. Related Sections include the following:

1. Division 01, Section "Submittal Procedures" for submitting photographic documentation.
2. Division 01, Section "Closeout Procedures" for coordinating closeout of the Contract.
3. Division 02, Section "Selective Structure Demolition" for photographic documentation before selective demolition operations commences.

**1.3 INFORMATIONAL SUBMITTALS**

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph.

- B. Digital Photographs: Submit image files within three (3) days of taking photographs.

1. Digital Camera: Minimum sensor resolution of eight (8) megapixels.
2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
3. Identification: Provide the following information with each image description in file metadata tag:
  - a. Name of Project.
  - b. Name and contact information for photographer.
  - c. Name of Architect.
  - d. Name of Contractor.
  - e. Date photograph was taken.
  - f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
  - g. Unique sequential identifier keyed to accompanying key plan.

**PART 2 - PRODUCTS****PART 3 - EXECUTION****3.1 CONSTRUCTION PHOTOGRAPHS**

- A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
  - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
  - 1. Date and Time: Include date and time in file name for each image.
  - 2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.
- C. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points.
- D. Periodic Construction Photographs: Take a minimum of one (4) photographs per week per building with the cutoff date associated with each Application for Payment. Take additional photographs if required by the scope of the work. Select vantage points to show status of construction and progress since last photographs were taken.
- E. Final Completion Construction Photographs: Take a minimum of four (4) color photographs of each building after date of Substantial Completion for submission as project record documents.

END OF SECTION 01 32 33

**SECTION 01 33 00 - SUBMITTAL PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

- B. Related Sections include the following:

1. Division 00, Section "Contracting Forms and Supplements" for documents to be delivered prior to the commencement of construction.
2. Division 01, Section "Summary" for deferred submittals.
3. Division 01, Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
4. Division 01, Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
5. Division 01, Section "Construction Waste Management Disposal" for handling requirements of construction waste.
6. Division 01, Section "Operations and Maintenance Data" for submitting operations and maintenance manuals.
7. Division 01, Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

**1.3 DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

#### 1.4 SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
  4. Format: Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal.
    - b. Specification Section number and title.
    - c. Submittal category: Action; informational.
    - d. Name of subcontractor.
    - e. Description of the Work covered.
    - f. Scheduled date for Architect's final release or approval.
    - g. Scheduled date of fabrication.
    - h. Scheduled dates for purchasing.
    - i. Scheduled dates for installation.

#### 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals.
1. Architect may furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawing and Project record drawings.
    - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - b. Digital Drawing Software Program: The Contract Drawings are available in AutoCAD 2009 format for Microsoft Windows.

- c. Contractor shall execute a data licensing agreement in the form of AIA Document C106, Digital Data Licensing Agreement.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
- 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  - 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.
- 1. Initial Review: Allow ten (10) working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
  - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  - 3. Resubmittal Review: Allow ten (10) working days for review of each re-submittal.
  - 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow fifteen (15) working days for initial review of each submittal.
- D. Form of Submittal: If approved by the Owner and the Architect, materials may be submitted electronically using procedures outlined. Architect may request paper submittals for items unable to be reviewed electronically.
- E. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
- 1. Indicate name of firm or entity that prepared each submittal on label or title block.
  - 2. 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.
  - 3. Include the following information for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Name of subcontractor.

- f. Name of supplier.
- g. Name of manufacturer.
- h. Submittal number or other unique identifier, including revision identifier.
  - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
  - i. Number and title of appropriate Specification Section.
  - j. Drawing number and detail references, as appropriate.
  - k. Location(s) where product is to be installed, as appropriate.
  - l. Other necessary identification.
- 4. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return without review submittals received from sources other than Contractor.
  - a. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
    - 1) Project name.
    - 2) Date.
    - 3) Destination (To:).
    - 4) Source (From:).
    - 5) Name and address of Architect.
    - 6) Name of Contractor.
    - 7) Name of firm or entity that prepared submittal.
    - 8) Names of subcontractor, manufacturer, and supplier.
    - 9) Category and type of submittal.
    - 10) Submittal purpose and description.
    - 11) Specification Section number and title.
    - 12) Drawing number and detail references, as appropriate.
    - 13) Indication of full or partial submittal.
    - 14) Transmittal number, numbered consecutively.
    - 15) Submittal and transmittal distribution record.
    - 16) Remarks.
    - 17) Signature of transmitter.

F. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

- 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
- 2. Name file with submittal number or other unique identifier, including revision identifier.
  - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01).

Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
  4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Name of firm or entity that prepared submittal.
    - g. Names of subcontractor, manufacturer, and supplier.
    - h. Category and type of submittal.
    - i. Submittal purpose and description.
    - j. Specification Section number and title.
    - k. Drawing number and detail references, as appropriate.
    - l. Location(s) where product is to be installed, as appropriate.
    - m. Related physical samples submitted directly.
    - n. Indication of full or partial submittal.
    - o. Transmittal number, numbered consecutively.
    - p. Submittal and transmittal distribution record.
    - q. Other necessary identification.
    - r. Remarks.
  5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
    - a. Project name.
    - b. Number and title of appropriate Specification Section.
    - c. Manufacturer name.
    - d. Product name.
- G. Options: Identify options requiring selection by Architect.
- H. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- I. Re-submittals: Make re-submittals in same form and number of copies as initial submittal.
  1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

- J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- K. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

- A. IMPORTANT NOTE: The submittal process is not a means to change the requirements of the Contract Documents. Approval of a submittal does not constitute a change order, change directive or acceptance of a substitution. Every submittal is assumed to and required to comply fully with the Contract Documents (including prior modifications). Installed work found later not to be in compliance with Contract Documents must be removed and replaced with work that is in compliance. If deviations are required due to field conditions, product availability, coordination limitations, etc., obtain Architect's approval through Contract Modification procedures prior to preparing and submitting submittal.
- B. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
  - 1. Submit electronic submittals via email as PDF electronic files.
    - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
  - 2. Submittals: Submit three (3) paper copies and (1) PDF electronic copies of each submittal unless otherwise indicated. Architect will return two (2) copies.
  - 3. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
  - 4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
    - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
  - 5. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- C. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
  5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. Three (3) paper copies and (1) PDF electronic copies of Product Data unless otherwise indicated. Architect will return two (2) paper copies.
- D. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
  3. Submit Shop Drawings in the following format:
    - a. Three (3) opaque (bond) copies and (1) PDF electronic copies of each submittal. Architect will return two (2) paper copies.

- E. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
    - e. Specification paragraph number and generic name of each item.
  3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
  4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
- F. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  2. Manufacturer and product name, and model number if applicable.
  3. Number and name of room or space.
  4. Location within room or space.
  5. Submit product schedule in the following format:
    - a. Three (3) paper copies and (1) PDF electronic copies of product schedule or list unless otherwise indicated. Architect, will return two (2) paper copies.

- G. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- H. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."
- I. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- J. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
  - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
  - 2. Number and title of related Specification Section(s) covered by subcontract.
  - 3. Submit subcontract list in the following format:
    - a. Four (4) paper copies and (2) PDF electronic copies.
- K. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - 1. Name of evaluation organization.
  - 2. Date of evaluation.
  - 3. Time period when report is in effect.
  - 4. Product and manufacturers' names.
  - 5. Description of product.
  - 6. Test procedures and results.
  - 7. Limitations of use.
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

## 2.2 DESIGN-BUILD / DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Design-Build / Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file or three (3)

paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

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

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

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

### 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 revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
  1. "No Exception Taken": That part of the Work covered by the submittal may proceed provided that it complies with the requirements of the contract Documents; final acceptance will depend upon compliance.
  2. "Make Corrections Noted": That part of the Work covered by the submittal may proceed provided it complies with the notations or correction on the submittal and requirements of the Contract Documents.
  3. "Revise and Resubmit": Do not proceed with that part of the Work covered by the submittal. Revise or prepare a new submittal in accordance with the notations, resubmit for re-review with delay.
  4. "Rejected": Do not proceed with that part of the Work covered by the submittal. Revise or prepare a new submittal in accordance with the Contract Documents; resubmit for re-review without delay.

5. “Submit Specified Item”: Do not proceed with that part of the Work covered by the submittal. This mark indicates that a non-specified item was submitted without proper approval of a substitution request, or that information on a specified item has not been submitted as required by that part of the Work covered by the submittal. Prepare a new submittal that utilizes specified item or an approved substitution.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- E. Incomplete and unstamped submittals are unacceptable, will be considered non-responsive, and will be returned for re-submittal without review.
- F. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 01 33 00

**SECTION 01 40 00 - QUALITY REQUIREMENTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
  - 4. Specific test and inspection requirements are not specified in this Section.
- C. Related Sections include the following:
  - 1. Division 01, Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
  - 2. Divisions 02 through 33 Sections for specific test and inspection requirements.

**1.3 DEFINITIONS**

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
  - 1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five (5) previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

#### 1.4 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the

minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

## 1.5 SUBMITTALS

- A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
  - 1. Indicate manufacturer and model number of individual components.
  - 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
- B. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- C. Qualification Data: For Contractor's quality-control personnel.
- D. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
  - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
  - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
- E. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- F. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Entity responsible for performing tests and inspections.
  - 3. Description of test and inspection.
  - 4. Identification of applicable standards.
  - 5. Identification of test and inspection methods.
  - 6. Number of tests and inspections required.
  - 7. Time schedule or time span for tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.

## 1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within ten (10) days of Notice to Proceed, and not less than five (5) days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records,

and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
  - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
  - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
  - 2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
  - 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

## 1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.
  - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
  2. Statement on condition of substrates and their acceptability for installation of product.
  3. Statement that products at Project site comply with requirements.
  4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  6. Statement whether conditions, products, and installation will affect warranty.
  7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
  2. Statement that equipment complies with requirements.
  3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  4. Statement whether conditions, products, and installation will affect warranty.
  5. Other required items indicated in individual Specification Sections.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

## 1.8 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  - 1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.

- e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
  - f. When project is complete, remove test specimens, assemblies, and mockups, do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
- 1. Build freestanding mockups in location and of size indicated or, if not indicated, as directed by Architect.
  - 2. Notify Architect seven (7) days in advance of dates and times when mockups will be constructed.
  - 3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
  - 4. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
    - a. Allow seven (7) days for initial review and each re-review of each mockup.
  - 6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  - 7. Demolish and remove mockups when directed unless otherwise indicated.
- L. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

## 1.9 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
- 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  - 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
  - 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
  3. Notify testing agencies at least twenty-four (24) hours in advance of time when Work that requires testing or inspecting will be performed.
  4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
  6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify

agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents and as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

#### 1.10 SPECIAL TESTS AND INSPECTIONS

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

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 ACCEPTABLE TESTING AGENCIES**

- A. Carlson Testing, Mayes Testing, PSI, or approved substitution.

**3.2 TEST AND INSPECTION LOG**

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

**3.3 REPAIR AND PROTECTION**

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

END OF SECTION 01 40 00

**SECTION 01 41 00 – DELEGATED DESIGN AND DEFERRED SUBMITTAL REQUIREMENTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for Delegated Design and Deferred Submittal responsibilities of the Contractor.

- B. Related Sections include the following:

1. Division 01, Section "Summary" for general Project information and description of construction delivered.
2. Division 01, Section "Submittal Procedures" for general submittal requirements and processing submittals during the construction stage.
3. Division 01, Section "Quality Requirements" for Project Quality Assurance and Quality Control and testing and inspection requirements.
4. Division 01, Section "Product Requirements" for general requirements for products used in Project.
5. Divisions 02 through 33 Sections for Project performance standards and criteria required for Delegated Design and Deferred Submittals.

**1.3 DEFINITIONS**

- A. Delegated Design: Product; system; or components' design performance specified in Contract Documents and requiring professional design services or certifications by a licensed design professional as part of Contractor responsibilities.
- B. Deferred Submittal: Submittal information pertaining to products, systems, or components requiring review and approval by Authorities Having Jurisdiction, but impacted by Contractor selection or decisions after contract award and receipt of permits.

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Delegated Design: Where Drawings or Specifications indicate Delegated Design, Contractor shall cause the services of a properly licensed design or engineering professional to design such systems or components.
  - 1. Delegated Designed systems or components are intended to be complete, operational systems, ready for their intended use.

2. Delegated Designed systems or components shall meet all applicable federal, state, and local requirements and be fully coordinated with all other components of the Work.
  3. Contractor shall follow the requirements of the governing Authorities Having Jurisdiction over the Project where the Work is being performed for regulated requirements current at the time of submission.
  4. Contractor shall be responsible for submitting all Delegated Design information to the Authorities Having Jurisdiction for review and approval for each Delegated Designed system or component.
  5. Contractor shall pay for all required review and permit fees required of the Authority Having Jurisdiction.
- B. Deferred Submittal: Where Drawings or Specifications indicate a Deferred Submittal, Contractor shall provide technical and engineering submittal information to verify compliance with the design intent described in the Contract Documents and applicable code and regulatory requirements over the Project where the Work is being performed.
1. Deferred Submittal systems or components are intended to be complete, operational systems, provided and ready for their intended use.
  2. Deferred Submittal systems or components shall meet all applicable federal, state, and local requirements and be fully coordinated with all other components of the Work.
  3. Contractor shall submit Deferred Submittal information to the Architect to review for general conformance with the design intent of the Project and with the information described in the Contract Documents.
  4. Contractor shall follow the requirements of the governing Authorities Having Jurisdiction over the Project where the Work is being performed for regulated requirements current at the time of submission.
  5. Contractor shall be responsible for submitting all Deferred Submittal information to the Authorities Having Jurisdiction for review and approval for each Deferred Submittal system or component.
  6. Contractor shall pay for all required review and permit fees required of the Authority Having Jurisdiction.
- C. Special Inspection: Code required special inspections apply to certain products, systems, and components of Delegated design systems and Deferred Submittals. Refer to Drawings and Specification Sections for special inspection requirements.

## 1.5 SUBMITTALS

- A. General: Delegated Design and Deferred submittals are required to show complete and operating components and systems. Submittals may include, but are not limited to show design assumptions, calculations, and detailed drawings, instructions for fabrication, assembly, installation, and interface with other trades, components, and systems.
- B. Completed submittals shall be submitted to the Architect for review after review and acceptance by Contractor. All submittals shall be submitted with the licensed design professional's stamp and seal for that portion of Work. Incomplete submittals will be returned to Contractor without review.

- C. Coordination: Coordinate preparation of submittals with Authorities Having Jurisdiction's review and approval process to ensure proper sequencing and execution of construction activities without delay.
- D. Delegated Design Submittals: Are in addition to other submittals identified in the Contract Documents.
- E. Deferred Submittals: Are in addition to other submittals identified in the Contract Documents.
- F. Qualification Data: For design professional preparing Delegated Design services or Deferred Submittals.

#### 1.6 QUALITY ASSURANCE

- A. Materials, General. Provide products and procedures necessary to prepare Delegated Design and Deferred Submittal service and obtain necessary permits and approvals. Although other Sections may specify some requirements that contribute to Delegated Design services, the Contractor shall determine additional material and procedures necessary to obtain required permits and approvals.

#### 1.7 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design service or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are not sufficient or there are inconsistencies within and between the Contract Documents, submit written request to the Architect on such form as required by the Contract documents.
- B. Delegated Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit copies of certificate, signed and sealed by the responsible design professional for each product and system specifically assigned to Contractor to be designed or certified by 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 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 CONTRACTOR'S REVIEW**

- A. Action and Information Submittals: Review each submittal and check for coordination with other Work of the Contract Documents and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect or Authorities Having Jurisdiction.

**3.2 DELEGATED DESIGN**

- A. Delegated Design Requirements to be provided by the Contractor include, but may not be limited to the following:

1. Division 03, Section "Precast Architectural Concrete."
2. Division 03, Section "Precast Concrete Treads."
3. Division 05, Section "Pipe and Tube Railings"
4. Division 07, Section "Cold Fluid-Applied Waterproofing."
5. Division 07, Section "Sheet Metal Flashing and Trim."
6. Division 07, Section "Penetration Firestopping."
7. Division 10, Section "Signage."
8. Division 21, Section "Basic Fire Suppression Requirements."
9. Division 21, Section "Fire Protection Basic Materials and Methods."
10. Division 21, Section "Fire Suppression Sprinklers."
11. Division 22, Section "Basic Plumbing Requirements."
12. Division 22, Section "Plumbing Piping."
13. Division 23, Section "Basic HVAC Requirements."
14. Division 26, Section "Electrical Design Build Requirements."
15. Division 32, Section "Planting Irrigation."

**3.3 DEFERRED SUBMITTALS**

- A. Deferred Submittals known at this time are indicated on Drawings.

END OF SECTION 01 41 00

**SECTION 01 42 00 - REFERENCES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 DEFINITIONS**

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

**1.3 INDUSTRY STANDARDS**

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

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

#### 1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AAMA	American Architectural Manufacturers Association <a href="http://www.aamanet.org">www.aamanet.org</a>	(847) 303-5664
ABAA	Air Barrier Association of America <a href="http://www.airbarrier.org">www.airbarrier.org</a>	(866) 956-5888
AHRI	Air-Conditioning, Heating, and Refrigeration Institute (The) <a href="http://www.ahrinet.org">www.ahrinet.org</a>	(703) 524-8800
AIA	American Institute of Architects (The) <a href="http://www.aia.org">www.aia.org</a>	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction <a href="http://www.aisc.org">www.aisc.org</a>	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute <a href="http://www.steel.org">www.steel.org</a>	(202) 452-7100
AITC	American Institute of Timber Construction <a href="http://www.aitc-glulam.org">www.aitc-glulam.org</a>	(303) 792-9559
ANSI	American National Standards Institute <a href="http://www.ansi.org">www.ansi.org</a>	(202) 293-8020
APA	APA - The Engineered Wood Association <a href="http://www.apawood.org">www.apawood.org</a>	(253) 565-6600

ARMA	Asphalt Roofing Manufacturers Association <a href="http://www.asphaltruofing.org">www.asphaltruofing.org</a>	(202) 207-0917
ASCE	American Society of Civil Engineers <a href="http://www.asce.org">www.asce.org</a>	(800) 548-2723 (703) 295-6300
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers <a href="http://www.ashrae.org">www.ashrae.org</a>	(800) 527-4723 (404) 636-8400
ASME	ASME International (American Society of Mechanical Engineers) <a href="http://www.asme.org">www.asme.org</a>	(800) 843-2763 (973) 882-1170
ASTM	ASTM International (American Society for Testing and Materials International) <a href="http://www.astm.org">www.astm.org</a>	(610) 832-9500
AWPA	American Wood Protection Association (Formerly: American Wood-Preservers' Association) <a href="http://www.awpa.com">www.awpa.com</a>	(205) 733-4077
AWS	American Welding Society <a href="http://www.aws.org">www.aws.org</a>	(800) 443-9353 (305) 443-9353
CISPI	Cast Iron Soil Pipe Institute <a href="http://www.cispi.org">www.cispi.org</a>	(404) 622-0073
CRRC	Cool Roof Rating Council <a href="http://www.coolroofs.org">www.coolroofs.org</a>	(866) 465-2523 (510) 485-7175
CSA	Canadian Standards Association <a href="http://www.csa.ca">www.csa.ca</a>	(800) 463-6727 (416) 747-4000
CSI	Construction Specifications Institute (The) <a href="http://www.csinet.org">www.csinet.org</a>	(800) 689-2900 (703) 684-0300
DHI	Door and Hardware Institute <a href="http://www.dhi.org">www.dhi.org</a>	(703) 222-2010
EJMA	Expansion Joint Manufacturers Association, Inc. <a href="http://www.ejma.org">www.ejma.org</a>	(914) 332-0040
FM Global	FM Global (Formerly: FMG - FM Global) <a href="http://www.fmglobal.com">www.fmglobal.com</a>	(401) 275-3000
FSC	Forest Stewardship Council U.S. <a href="http://www.fscus.org">www.fscus.org</a>	(612) 353-4511
GA	Gypsum Association	(301) 277-8686

	www.gypsum.org	
GANA	Glass Association of North America www.glasswebsite.com	(785) 271-0208
HMMA	Hollow Metal Manufacturers Association (See NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
ICBO	International Conference of Building Officials (See ICC)	
ICC	International Code Council www.iccsafe.org	(888) 422-7233 (202) 370-1800
IES	Illuminating Engineering Society (Formerly: Illuminating Engineering Society of North America) www.ies.org	(212) 248-5000
IGMA	Insulating Glass Manufacturers Alliance www.igmaonline.org	(613) 233-1510
MCA	Metal Construction Association www.metalconstruction.org	(847) 375-4718
MFMA	Metal Framing Manufacturers Association, Inc. www.metalframingmfg.org	(312) 644-6610
MPI	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	North American Insulation Manufacturers Association www.naima.org	(703) 684-0084
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NFPA	NFPA (National Fire Protection Association)	(800) 344-3555 (617) 770-3000

	www.nfpa.org	
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-1776
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
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NSPE	National Society of Professional Engineers www.nspe.org	(703) 684-2800
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
UL	Underwriters Laboratories Inc. www.ul.com	(877) 854-3577
USGBC	U.S. Green Building Council www.usgbc.org	(800) 795-1747
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WDMA	Window & Door Manufacturers Association www.wdma.com	(800) 223-2301 (312) 321-6802
WSRCA	Western States Roofing Contractors Association www.wsrsa.com	(800) 725-0333 (650) 938-5441
WWPA	Western Wood Products Association www.wwpa.org	(503) 224-3930

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

ICC	International Code Council	(888) 422-7233
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[www.iccsafe.org](http://www.iccsafe.org)

ICC-ES	ICC Evaluation Service, LLC <a href="http://www.icc-es.org">www.icc-es.org</a>	(800) 423-6587 (562) 699-0543
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D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

HUD	Department of Housing and Urban Development <a href="http://www.hud.gov">www.hud.gov</a>	(202) 708-1112
OSHA	Occupational Safety & Health Administration <a href="http://www.osha.gov">www.osha.gov</a>	(800) 321-6742

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

[www.wbdg.org/ccb](http://www.wbdg.org/ccb)

MILSPEC	Military Specification and Standards (See DOD)	
USAB	United States Access Board <a href="http://www.access-board.gov">www.access-board.gov</a>	(800) 872-2253 (202) 272-0080
USATBCB	U.S. Architectural & Transportation Barriers Compliance Board (See USAB)	

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

SCAQMD	South Coast Air Quality Management District <a href="http://www.aqmd.gov">www.aqmd.gov</a>	(909) 396-2000
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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

**SECTION 01 45 00 - AIR BARRIER SYSTEM COORDINATION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This section includes administrative and procedural requirements for accomplishing an airtight building enclosure that controls infiltration or exfiltration of air.
1. The airtight components of the building enclosure and the joints, junctures and transitions between materials, products, and assemblies forming the air-tightness of the building enclosure are called “the air barrier system”. Services include coordination between the trades, the proper scheduling and sequencing of the work, preconstruction meetings, and related actions, including reports performed by Contractor, and by governing authorities. They do not include contract enforcement activities performed by Architect.
  2. The Contractor shall ensure that the intent of constructing the building enclosure with a continuous air barrier system to control air leakage into, or out of the conditioned space is achieved. The air barrier system shall have the following characteristics:
    - a. It must be continuous, with all joints sealed.
    - b. It must be structurally supported to withstand positive and negative air pressures applied to the building enclosure.
    - c. Connection shall be made between:
      - 1) Foundation and walls.
      - 2) Walls and windows or doors.
      - 3) Different wall systems.
      - 4) Wall and roof.
      - 5) Wall and roof over unconditioned space.
      - 6) Walls, floor and roof across construction, control and expansion joints.
      - 7) Walls, floors and roof to utility, pipe and duct penetrations.
  3. Air Barrier Penetrations: All penetrations of the air barrier and paths of air infiltration / exfiltration shall be sealed.
- B. Requirements of this section relate to the coordination between subcontractors required to provide an airtight building enclosure, customized fabrication and installation procedures, not production of standard products.
1. Continuity of the air barrier materials and products with joints to provide assemblies. Continuity of all the enclosure assemblies with joints and transition materials to provide a whole building air barrier system.
  2. Specific quality-control requirements for individual construction activities are specified in the sections of the specifications. Requirements in those sections may

also cover production of standard products. It is the Contractor's responsibility to ensure that each subcontractor is adequately and satisfactorily performing the quality assurance documentation, tests and procedures required by each section.

3. Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.
4. Requirements for Contractor to provide an airtight building enclosure is not limited by quality-control services required by Architect, Owner, or authorities having jurisdiction and are not limited by provisions of this section.

### 1.3 RESPONSIBILITIES

- A. Contractor Responsibilities: Unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide coordination of the trades, and the sequence of construction to ensure continuity of the air barrier system joints, junctures and transitions between materials and assemblies of materials and products, from substructure to walls to roof. Provide quality assurance procedures, testing and verification as specified herein. Facilitate inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction or by the Owner. Costs for these services are included in the Contract Sum.
1. Organize preconstruction meetings between the trades involved in the whole building's air barrier system to discuss where each trade begins and ends and the responsibility and sequence of installation of all the air-tight joints, junctures, and transitions between materials, products and assemblies of products specified in the different sections, to be installed by the different trades.
  2. Build a mock-up before proceeding with the work, satisfactory to the Architect, of each air-tight joint type, juncture, and transition between products, materials and assemblies.

### 1.4 PERFORMANCE REQUIREMENTS

- A. Compliance Alternatives:
- a. Materials: materials used for the air barrier system in the opaque envelope shall have an air permeance not to exceed 0.004 cfm/ft<sup>2</sup> under a pressure differential of 0.3 in. water (1.57psf) (0.02 L/s.m<sup>2</sup> @ 75 Pa) when tested in accordance with ASTM E 2178.

### 1.5 SUBMITTALS

- A. Coordination Plan: Contractor to submit plan for verifying air-barrier materials installed conform with the following requirements.
1. Continuity of the air barrier system throughout the building enclosure with no gaps or holes is maintained.
  2. Backing of the air barrier system has been provided.
  3. Concrete surfaces are smooth, clean and free of cavities, protrusions and mortar droppings.

4. Site conditions for application temperature and dryness of substrates are per manufacturer's requirements.
5. Maximum length of exposure time of materials to ultra-violet deterioration has not been exceeded.
6. Surfaces are properly primed.
7. Laps in material are per-manufacturer's requirements, shingled in the correct direction (or mastic applied on exposed edges), with no fish-mouths.
8. Mastic or tape applied on cut edges.
9. Roller has been used to enhance adhesion.
10. Application thickness of liquid-applied materials conforms to manufacturer's specifications for the specific substrate.
11. Compatibility of materials used
12. Air barrier maintains integrity at transitions and changes in direction, and has backing at gaps.
13. Surfaces and materials have been cleaned, prepared and primed properly before installation of air barrier materials.
14. All penetrations sealed.

## PART 2 - PRODUCTS

(See individual sections)

## PART 3 - EXECUTION

### 3.1 REPAIR AND PROTECTION

- A. Repair and protection of the air barrier is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services if used.

END OF SECTION 01 45 00

**SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections include the following:
  - 1. Division 01, Section "Summary" for work restrictions and limitations on utility interruptions.
  - 2. Division 01, Section "Construction Waste Management Disposal" for handling requirements of construction waste.

**1.3 USE CHARGES**

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

**1.4 SUBMITTALS**

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: If required by permit, show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
  - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.

2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
  3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
1. Locations of dust-control partitions and/or other methods at each phase of work
  2. HVAC system isolation schematic drawing.
  3. HVAC filter replacement schedule and type.
  4. Waste handling procedures.
  5. Other dust-control measures.

## 1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

## 1.6 PROJECT CONDITIONS

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

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch, 9ga. thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

- C. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.
- D. Signs: MDO plywood

## 2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
  - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
  - 2. Conference room of sufficient size to accommodate meetings of ten (10) individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot square tack and marker boards.
  - 3. Drinking water and private toilet.
  - 4. Coffee machine and supplies.
  - 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
  - 6. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
  - 1. Store combustible materials apart from building.

## 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
  - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of eight (8) at each return-air grille in system and remove at end of construction and clean HVAC system as required in Division 01, Section "Closeout Procedures".

**PART 3 - EXECUTION****3.1 INSTALLATION, GENERAL**

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

**3.2 TEMPORARY UTILITY INSTALLATION**

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. 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: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
  - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
    - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
    - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.

2. Maintain dust partitions or other methods during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
  3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one (1) telephone line(s) for each field office.
1. At each telephone, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.
    - c. Contractor's home office.
    - d. Contractor's emergency after-hours telephone number.
    - e. Architect's office.
    - f. Engineers' offices.
    - g. Owner's office.
    - h. Principal subcontractors' field and home offices.
  2. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

### 3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Provide construction for temporary offices within construction area or within 30 feet of building lines. Comply with NFPA 241.
  2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial

Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
  - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Parking: Use designated areas of Owner's existing parking areas or on-street parking for construction personnel.
- D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site and construction free of water.
  - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
  - 2. Remove snow and ice as required to minimize accumulations.
- E. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
  - 1. Identification Signs: Provide 4 x 8 ft project identification sign. Layout as directed by Architect.
  - 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
    - a. Provide temporary, directional signs for construction personnel and visitors.
    - b. Provide identification signs as required by local authorities having jurisdiction.
  - 3. Maintain and touchup signs so they are legible at all times.
- F. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
  - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- I. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- J. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  - 1. Comply with work restrictions specified in Section 01 10 00 "Summary."
- B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
  - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
  - 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
  - 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
  - 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- C. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
- E. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- G. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
  - A. 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.
  - B. Temporary Dust Control: Provide dust control for protection of construction, existing facilities and operations. Revise dust control plan and provide additional dust control as need arises during demolition and construction.
  - C. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

### 3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
  1. Protect porous materials from water damage.
  2. Protect stored and installed material from flowing or standing water.
  3. Keep porous and organic materials from coming into prolonged contact with concrete.
  4. Remove standing water from decks.
  5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
  1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
  2. Keep interior spaces reasonably clean and protected from water damage.
  3. Periodically collect and remove waste containing cellulose or other organic matter.
  4. Discard or replace water-damaged material.
  5. Do not install material that is wet.
  6. Discard, replace, or clean stored or installed material that begins to grow mold.
  7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction:
  1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
  2. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
    - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for forty-eight (48) hours are considered defective.
    - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for forty-eight (48) hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.

- c. Remove materials that cannot be completely restored to their manufactured moisture level within forty-eight (48) hours.

### 3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
  - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
  - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  - 2. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
  - 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division01, Section "Closeout Procedures."

END OF SECTION 01 50 00

**SECTION 01 5639-TEMPORARY TREE AND PLANT PROTECTION****PART 1 - GENERAL****1.1 DESCRIPTION**

- A. This Section includes the protection and trimming of trees that interfere with, or are affected by, execution of the Work, whether temporary or new construction.
- B. Related Sections include the following:
  - 1. Division 01 Section "Summary" for limits placed on Contractor's use of the site.
  - 2. Division 31 Section "Earth Moving" for building and utility trench excavation, backfilling, compacting, grading requirements, and soil materials placement.
  - 3. Division 32 Section "Soil Preparation" for soil materials and amendments.
  - 4. Division 32 Section "Plants" for tree and shrub planting, and tree support systems.

**1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Owner's Representatives and owners, and other information specified.
- C. Certification: Written certification from a qualified arborist that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- D. Maintenance Recommendations: From a qualified arborist for care and protection of trees affected by construction during and after completing the Work.
- E. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
  - 1. Use sufficiently detailed photographs or videotape.
  - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

**1.3 QUALITY ASSURANCE**

- A. Tree Service Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site on a full-time basis during execution of the Work.

- B. Arborist Qualifications: An arborist certified by the International Society of Arboriculture or licensed in the jurisdiction where Project is located.
- C. Tree Pruning Standards: Comply with ANSI A300, "Trees, Shrubs, and Other Woody Plant Maintenance, Standard Practices," unless more stringent requirements are dictated by the arborist or governing agencies.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
  - 1. Before starting tree protection and trimming, meet with representatives of authorities having jurisdiction, Owner, Owner's Representative, consultants, and other concerned entities. Review tree protection and trimming procedures and responsibilities. Notify participants at least three working days before convening conference. Record discussions and agreements and furnish a copy to each participant.

#### 1.4 PROJECT CONDITIONS

- A. The following practices are prohibited within tree and shrub protection zones:
  - 1. Storage of construction materials, debris, or excavated material.
  - 2. Parking vehicles or equipment.
  - 3. Vehicle or foot traffic.
  - 4. Erection of sheds or structures.
  - 5. Impoundment of water.
  - 6. Excavation or other digging unless otherwise indicated.
  - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. Drainage Fill: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D 448, Size 24, with 90 to 100 percent passing a 2-1/2-inch sieve and not more than 10 percent passing a 3/4-inch sieve.
- B. Topsoil: Fertile, friable, surface soil, containing natural loam and complying with ASTM D 5268. Provide topsoil that is free of stones larger than 1 inch in any dimension and free of other extraneous or toxic matter harmful to plant growth. Obtain topsoil only from well-drained sites where soil occurs in depth of 4 inches or more; do not obtain from bogs or marshes.

- C. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.
- D. Chain Link Fence: Metallic-coated steel chain link fence fabric, 0.120-inch-diameter wire size; 48 inches high, minimum; line posts, 1.9 inches in diameter; terminal and corner posts, 2-3/8 inches in diameter; top rail, 1-5/8 inches in diameter; bottom tension wire, 0.177 inch in diameter; with tie wires, hog ring ties, and other accessories for a complete fence system.
- E. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering and as follows:
  - 1. Lettering: 3-inch- (75-mm-) high minimum, black characters on white background.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Protection Zone Fencing: Install fencing located as indicated or outside the drip line of trees to protect remaining vegetation from construction damage.
  - 1. Install chain link fence according to ASTM F 567 and manufacturer's written instructions.
- B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect. Install one sign spaced approximately every 20 feet (6 m) on protection-zone fencing, but no fewer than four signs with each facing a different direction.
- C. Protect tree root systems from damage due to noxious materials caused by runoff or spillage while mixing, placing, or storing construction materials. Protect root systems from flooding, eroding, or excessive wetting caused by dewatering operations.
- D. Protect all existing plant material to remain against unnecessary cutting, breaking, or skinning of roots and branches, skinning and bruising of bark.
- E. Do not store construction materials, debris, or excavated material within the drip line of remaining trees. Do not permit vehicles or foot traffic within the drip line; prevent soil compaction over root systems.
- F. Do not allow fires under or adjacent to remaining trees or other plants.
- G. Do not spray any herbicide or toxic substance within drip line of all existing plant material without approval of Owner's Representative.
- H. Water trees and other vegetation which are to remain as necessary to maintain their health during the course of the work. Rate of frequency of application to be determined jointly by Arborist and Owner's Representative.

### 3.2 EXCAVATION AROUND TREES

- A. Do not excavate within drip line of trees, unless otherwise indicated.
- B. Install shoring or other protective support systems to minimize sloping or benching of excavations.
- C. Where trenching is required within drip lines, tunnel under or around roots by hand digging or boring. Do not cut main lateral roots or tap roots; cut smaller roots that interfere with installation of new work.
- D. Where excavating for new construction is required within drip line of trees, hand excavate to minimize damage to root systems. Use narrow tine spading forks and comb soil to expose roots.
  - 1. Relocate roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and relocate them without breaking. If encountered immediately adjacent to location of new construction and relocation is not practical, cut roots approximately 3 inches back from new construction.
  - 2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.
- E. Where utility trenches are required within drip line of trees, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.
  - 1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.
- F. Prune branches in accordance with good horticultural practice to balance loss to root system caused by damage or cutting of root system.

### 3.3 GRADING AND FILLING AROUND TREES

- A. Maintain existing grade within drip line of trees unless otherwise indicated. Install protection measures as shown on the Drawings.
- B. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond drip line of trees. Maintain existing grades within drip line of trees.
- C. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by qualified arborist, unless otherwise indicated.
  - 1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots with sharp pruning instruments; do not break or chop.

- D. Minor Fill: Where existing grade is 6 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.
- E. Moderate Fill: Where existing grade is more than 6 inches, but less than 12 inches, below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:
  - 1. Carefully place drainage fill against tree trunk approximately 2 inches above elevation of finish grade and extend not less than 18 inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill up to 6 inches below elevation of grade.
  - 2. Place filter fabric with edges overlapping 6 inches minimum.
  - 3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

### 3.4 TREE PRUNING

- A. Prune remaining trees affected by temporary and new construction as approved by Owner's Representative.
- B. Prune remaining trees to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by qualified arborist.
- C. Pruning Standards: Prune trees according to ANSI A300 as follows:
  - 1. Type of Pruning: Crown cleaning.
  - 2. Type of Pruning: Crown thinning.
  - 3. Type of Pruning: Crown raising.
  - 4. Type of Pruning: Crown reduction.
  - 5. Type of Pruning: Vista pruning.
  - 6. Type of Pruning: Crown restoration.
- D. Cut branches with sharp pruning instruments; do not break or chop.
- E. Chip branches removed from trees. Spread chips where indicated on the Drawings or as directed by Owner's Representative.

### 3.5 TREE REPAIR AND REPLACEMENT

- A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to written instructions of the qualified arborist. Engage a qualified tree surgeon to advise Contractor on appropriate protection measures and to perform tree repair work if required. Make repairs promptly after damage occurs at no additional cost to the Owner.
- B. Remove and replace dead and damaged trees that the qualified arborist determines to be incapable of restoring to a normal growth pattern.

1. Provide new trees of the same size and species as those being replaced; plant and maintain as specified in Division 32 Section "Plants."
- C. Provide new trees of 6-inch caliper size and of a species selected by Owner's Representative when trees more than 6 inches in caliper size, measured 12 inches above grade, are required to be replaced.
- D. Owner may elect to receive compensation for plants destroyed or damaged by the Contractor. Trees shall be valued at \$2,500 each, and shrubs at \$100 each. The compensation shall be paid by the Contractor for each occurrence of loss due to the Contractor's activities or negligence.
- E. Aerate surface soil, compacted during construction, 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch diameter holes a minimum of 12 inches deep at 24 inches on center. Backfill holes with an equal mix of augered soil and sand.

### 3.6 DISPOSAL OF WASTE MATERIALS

- A. Burning is not permitted.
- B. Disposal: Remove excess excavated material, displaced trees, and excess chips from Owner's property.

END OF SECTION 01 5639

**SECTION 01 60 00 - PRODUCT REQUIREMENTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Sections include the following:
1. Division 01, Section "Alternates" for products selected under an alternate.
  2. Division 01, Section "Substitution Procedures" for requests for substitutions.
  3. Division 01, Section "References" for applicable industry standards for products specified.

**1.3 DEFINITIONS**

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

#### 1.4 SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
  - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
    - a. Form of Approval: As specified in Division 01, Section "Submittal Procedures."
    - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01, Section "Submittal Procedures." Show compliance with requirements.

#### 1.5 QUALITY ASSURANCE

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

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

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

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

## 1.7 PRODUCT WARRANTIES

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

## PART 2 - PRODUCTS

### 2.1 PRODUCT SELECTION PROCEDURES

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

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

B. Product Selection Procedures:

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

6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
  7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
  8. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01, Section "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or similar phrase, select a product that complies with requirements.
1. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
  2. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

**SECTION 01 73 00 - EXECUTION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

- B. Related Sections include the following:

1. Division 01, Section "Summary" for limits on use of Project site.
2. Division 01, Section "Submittal Procedures" for submitting surveys.
3. Division 01, Section "Closeout Procedures" for final cleaning.
4. Division 02, Section "Structure Demolition" for demolition and removal of existing improvements.
5. Division 07, Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

**1.3 DEFINITIONS**

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.
- C. Cutting and Patching Plan: Submit plan describing procedures at least ten (10) days prior to the time cutting and patching will be performed. Include the following information:
1. Extent: Describe reason for and extent of each occurrence of cutting and patching.

2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
  3. Products: List products to be used for patching and firms or entities that will perform patching work.
  4. Dates: Indicate when cutting and patching will be performed.
  5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
    - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

#### 1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
  2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
    - a. Primary operational systems and equipment.
    - b. Fire separation assemblies.
    - c. Air or smoke barriers.
    - d. Fire-suppression systems.
    - e. Mechanical systems piping and ducts.
    - f. Control systems.
    - g. Communication systems.
    - h. Fire-detection and -alarm systems.
    - i. Conveying systems.
    - j. Electrical wiring systems.
    - k. Operating systems of special construction.
  3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

- a. Water, moisture, or vapor barriers.
  - b. Membranes and flashings.
  - c. Exterior curtain-wall construction.
  - d. Sprayed fire-resistive material.
  - e. Equipment supports.
  - f. Piping, ductwork, vessels, and equipment.
  - g. Noise- and vibration-control elements and systems.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

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

## PART 3 - EXECUTION

### 3.1 DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

- A. Unless otherwise provided in the Owner/Contractor agreement, the Owner shall furnish to the contractor one (1) copy of the Contract Documents for the purposes of making reproductions.
- B. The Contractor, Subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for the execution

of the Work. All copies made shall bear the copyright notice, if any, shown on the Instruments of Service. The contractor, Subcontractors and material and equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

### 3.2 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation or re-installation.
  - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - 1. Description of the Work.
  - 2. List of detrimental conditions, including substrates.
  - 3. List of unacceptable installation tolerances.
  - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.3 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Division 01, Section "Project Management and Coordination."

### 3.4 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels.

### 3.5 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
  2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
  1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
  2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

### 3.6 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
  - 1. Make vertical work plumb and make horizontal work level.
  - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.
- K. Cuts: Make all cross cuts square to the material being cut unless otherwise indicated. Make all longitudinal cuts parallel to edges of material being cut unless otherwise indicated. Make all angled cuts parallel to adjacent material unless otherwise indicated. Use squares, straight edges

or guides as required to produce straight cut edges. Cuts shall not deviate from a straight line more than 1/16 inch over 96 inches. Do not overcut inside corners. Replace work that does not meet cut requirements.

- L. Layout Marks: Remove layout marks from all surfaces exposed to view. Including but not limited to chalk lines, pencil and pen lines and annotations.

### 3.7 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching with Owner and Tenants as necessary to minimize interference.
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete, Stucco and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  5. Proceed with patching after construction operations requiring cutting are complete.

- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Walls: At window replacement in walls patch and repair wall surfaces in the existing wall. Provide an even surface of uniform finish, color, texture, and appearance that matches existing finish. Remove in-place wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
  3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
  - 1. Remove liquid spills promptly.
  - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01, Section "Temporary Facilities and Controls" and Division 01, Section "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### 3.9 STARTING AND ADJUSTING

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

**3.10 PROTECTION OF INSTALLED CONSTRUCTION**

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

**3.11 CORRECTION OF THE WORK**

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
  - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

**SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

- B. Related Requirements:

1. Division 02, Section "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements, and for disposition of hazardous waste.
2. Division 31, Section "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

**1.3 DEFINITIONS**

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

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total non-hazardous recyclable solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. A goal of 95 percent recycling of recyclable waste is encouraged. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials.

#### 1.5 SUBMITTALS

- A. Waste Management Plan: Submit plan within 7 days of date established for commencement of the Work.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use separate forms acceptable to the owner for construction waste and for demolition waste. Include the following information:
  1. Material category.
  2. Generation point of waste.
  3. Total quantity of waste in tons.
  4. Quantity of waste salvaged, both estimated and actual in tons.
  5. Quantity of waste recycled, both estimated and actual in tons.
  6. Total quantity of waste recovered (salvaged plus recycled) in tons.
  7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

#### 1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01, Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of waste management coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

## 1.7 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition site-clearing and construction waste generated by the Work. Use forms acceptable to the owner. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use forms acceptable to the owner. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
  2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
  3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

**PART 2 - PRODUCTS (Not Used)****PART 3 - EXECUTION****3.1 PLAN IMPLEMENTATION**

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
  - 1. Comply with operation, termination, and removal requirements in Division 01, Section "Temporary Facilities and Controls."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
  - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
  - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
  - 2. Comply with Division 01, Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

**3.2 SALVAGING DEMOLITION WASTE**

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  - 3. Store items in a secure area until installation.
  - 4. Protect items from damage during transport and storage.
  - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Not permitted on Project site.
- C. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:
  - 1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area designated by Owner.
  5. Protect items from damage during transport and storage.
- D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- F. Plumbing Fixtures: Separate by type and size.
- G. Lighting Fixtures: Separate lamps by type and protect from breakage.
- H. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

### 3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

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

### 3.4 RECYCLING DEMOLITION WASTE

- A. Asphalt Paving: Break up as required by recycling facility and transport paving to asphalt-recycling facility or if materials comply with Section 31 20 00 "Earth Moving" and are approved for such use reused as general fill.
- B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
  - 1. Pulverize concrete to maximum 1-1/2-inch size.
  - 2. Crush concrete and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as satisfactory soil for fill or subbase.
- C. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- D. Metals: Separate metals by type.
  - 1. Structural Steel: Stack members according to size, type of member, and length.
  - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- E. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- F. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- G. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- H. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- I. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
  - 1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- J. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- K. Conduit: Reduce conduit to straight lengths and store by type and size.

### 3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
  - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
  - 2. Polystyrene Packaging: Separate and bag materials.

3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

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

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

### 3.6 DISPOSAL OF WASTE

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

END OF SECTION 01 74 19

**SECTION 01 77 00 - CLOSEOUT PROCEDURES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

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

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

- B. Related Sections include the following:

1. Division 01, Section "Photographic Documentation" for submitting final completion construction photographic documentation.
2. Division 01, Section "Execution" for progress cleaning of Project site..
3. Division 01, Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

**1.3 SUBMITTALS**

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

**1.4 CLOSEOUT SUBMITTALS**

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

**1.5 MAINTENANCE MATERIAL SUBMITTALS**

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

**1.6 SUBSTANTIAL COMPLETION PROCEDURES**

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. Label with manufacturer's name and model number where applicable.
  - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Owner's signature for receipt of submittals.
5. Submit test/adjust/balance records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01, Section "Demonstration and Training."

6. Participate with Owner in conducting inspection and walkthrough with designated personnel.
  7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  8. Complete final cleaning requirements, including touchup painting.
  9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
  2. Results of completed inspection will form the basis of requirements for final completion.

## 1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Division 01, Section "Payment Procedures."
  2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reviews: Submit a written request for final review to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final review and tests. On receipt of request, Architect will either proceed with review or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Re-review: Request re-review when the Work identified in previous inspections as incomplete is completed or corrected.
  2. Extra-review: Where the Architect performs more than two reviews for Substantial Completion or for the Final Review due to failure of the Work to comply with claims of completeness or correctness made by the Contractor, all costs (including additional Architect and Owner services made necessary by such failure) shall be reimbursed by Contractor.

**1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)**

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A or approved.
1. Organize list of spaces in sequential order by roof area.
  2. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect and Owner
    - d. Name of Contractor.
    - e. Page number.
  3. Submit list of incomplete items in the following format:
    - a. MS Excel, PDF electronic files, or three paper copies. Architect will return annotated list.

**1.9 SUBMITTAL OF PROJECT WARRANTIES**

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 10 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

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

## PART 3 - EXECUTION

### 3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - g. Sweep concrete floors broom clean in unoccupied spaces.
    - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.

- j. Remove labels that are not permanent.
  - k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  - l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
  - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
  - n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
    - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
  - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
  - p. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Division 01, Section "Construction Waste Management and Disposal."
- D. Pest Control: Maintain pest control measures as necessary until final completion.

### 3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
  - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
  - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
    - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
  - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
  - 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

**SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Operation manuals for systems, subsystems, and equipment.
3. Product maintenance manuals.
4. Systems and equipment maintenance manuals.

- B. Related Sections include the following:

1. Division 01, Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

**1.3 DEFINITIONS**

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

**1.4 CLOSEOUT SUBMITTALS**

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

- B. Format: Submit operations and maintenance manuals in the following format:

1. Two CD's of PDF electronic files. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

- a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
  - b. Enable inserted reviewer comments on draft submittals.
2. Two (2) paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect return two (2) copies, both of which are intended for Owner's use.
- C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least fifteen (15) days before commencing demonstration and training. Architect will return copy with comments.
    1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within fifteen (15) days of receipt of Architect's comments and prior to commencing demonstration and training.

## PART 2 - PRODUCTS

### 2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
  1. List of documents.
  2. List of systems.
  3. List of equipment.
  4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

## 2.2 REQUIREMENTS FOR OPERATION AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
  1. Title page.
  2. Table of contents.
  3. Manual contents.
- B. Title Page: Include the following information:
  1. Subject matter included in manual.
  2. Name and address of Project.
  3. Name and address of Owner.
  4. Date of submittal.
  5. Name and contact information for Contractor.
  6. Name and contact information for Construction Manager.
  7. Name and contact information for Architect.
  8. Name and contact information for Commissioning Authority.
  9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
  1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
  1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
  - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
  - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
  - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
  - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## 2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
  1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  2. Performance and design criteria if Contractor has delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
  5. Operating logs.
  6. Wiring diagrams.
  7. Control diagrams.
  8. Piped system diagrams.
  9. Precautions against improper use.
  10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
  1. Product name and model number. Use designations for products indicated on Contract Documents.

2. Manufacturer's name.
  3. Equipment identification with serial number of each component.
  4. Equipment function.
  5. Operating characteristics.
  6. Limiting conditions.
  7. Performance curves.
  8. Engineering data and tests.
  9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

#### 2.4 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
  2. Manufacturer's name.
  3. Color, pattern, and texture.
  4. Material and chemical composition.
  5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.

2. Types of cleaning agents to be used and methods of cleaning.
  3. List of cleaning agents and methods of cleaning detrimental to product.
  4. Schedule for routine cleaning and maintenance.
  5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

## 2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
  1. Standard maintenance instructions and bulletins.
  2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  3. Identification and nomenclature of parts and components.
  4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  1. Test and inspection instructions.
  2. Troubleshooting guide.
  3. Precautions against improper maintenance.
  4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  5. Aligning, adjusting, and checking instructions.
  6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

### PART 3 - EXECUTION

#### 3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
  1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
  1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of operation and maintenance manuals.
  2. Comply with requirements of newly prepared record Drawings in Division 01, Section "Project Record Documents."
- G. Comply with Division 01, Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

**SECTION 01 78 39 - PROJECT RECORD DOCUMENTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

- B. Related Sections include the following:

1. Division 01, Section "Execution" for final property survey.
2. Division 01, Section "Closeout Procedures" for general closeout procedures.
3. Division 01, Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
4. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

**1.3 CLOSEOUT SUBMITTALS**

- A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:
  - a. Submit two (2) paper-copy sets and two (2) sets of CD's containing PDF files of marked-up record prints.
  - b. Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

- B. Record Specifications: Submit two (2) paper copy sets two (2) sets of CD's with annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

- C. Record Product Data: Submit two (2) paper copies and (2) sets of CD's with annotated PDF electronic files and directories of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit two (2) paper copies and two (2) sets of CD's with annotated PDF electronic files and directories of each submittal.

## PART 2 - PRODUCTS

### 2.1 RECORD DRAWINGS

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

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
  2. Format: DWG, Version , Microsoft Windows operating system.
  3. Format: Annotated PDF electronic file with comment function enabled.
  4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
  5. Refer instances of uncertainty to Architect for resolution.
  6. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
    - a. See Division 01, Section "Submittal Procedures" for requirements related to use of Architect's digital data files.
    - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
  2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Format: Annotated PDF electronic file with comment function enabled.
  3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
  4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

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

## 2.3 RECORD PRODUCT DATA

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

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as two (2) paper copies and two (2) sets of CD's with scanned PDF electronic file(s) of marked-up paper copy of Specifications.
  - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

**PART 3 - EXECUTION****3.1 RECORDING AND MAINTENANCE**

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

END OF SECTION 01 78 39

**SECTION 01 81 13 – OHCS SUSTAINABLE DESIGN REQUIREMENTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This project requires compliance with Oregon Housing and Community Services (OHCS) Green Building Path criteria.
- B. The General Contractor and subcontractors have essential roles in the credits related to products and procedures used for construction which are the responsibility of the contractor to implement and document. The full cooperation of the Contractor and subcontractors is essential to achieving the final certification.
- C. The General Contractor shall be familiar with the relevant OHCS requirements and standards and provide the necessary information and instruction to all subcontractors and installers.
- D. Remove and provide all appliance and product efficiency labels as required.

**1.3 OHCS PATH WORKSHEET****A. Mandatory Green Measures**

1. Rehabilitation of existing structures.
2. Provide an energy audit performed by a qualified energy consultant and which was completed prior to finalizing scope of work.
3. Select native trees and plants that are appropriate to the site and climate when landscape improvements are in the scope of work.
4. Replace all existing toilets in all units that use 1.6 gallons or more water per flush.
5. Insulate 100% of the attic and crawlspace to meet or exceed the locality's current code requirements for new construction.
6. Either replace showerheads, kitchen and bathroom faucets or install flow restrictors to meet a maximum flow of 2.0 gallons per minute.
7. Install Energy-Star labeled appliances in all units when appliances are replaced.
8. Install Energy-Star labeled lighting fixtures or high-efficiency commercial grade fixtures in common areas when fixtures are replaced. Install compact fluorescent lamps (CFL) in the balance of all existing units and common areas.

9. Provide a guide for renters that explains the intent, benefits, use and maintenance of green building features and encourages additional green activities such as recycling, gardening and use of healthy cleaning materials.
10. Provide architect's or energy consultants verification (on OHCS form) that work was completed as stated.
11. Install blown-in fibrous insulation or sprayed-in-place foam (SPF). Insulation must fill cavity and touch all six surfaces.
12. Water heater replacements for tanks under 60 gallons: Electric = 0.93 EF and Gas = 0.61 EF.
13. When installing or replacing zonal heating systems, digital temperature controls shall be installed.

B. Optional Green Measures (as selected)

1. Locate projects within  $\frac{1}{4}$  mile of at least two, or  $\frac{1}{2}$  mile of at least four community and retail facilities, such as schools, parks, grocers, libraries and other services.
2. Roof materials with 40 year or higher warranty.
3. Specify that all interior paints, primers and adhesives and sealants must contain low or no Volatile Organic Compounds (VOC).
4. When replaced, install energy-efficient windows which exceed minimal local code requirements by 10%. (Use minimum standards indicated on the Low Income Weatherization Program Energy Efficiency Plan Worksheets.)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 81 13

**SECTION 01 82 00 - DEMONSTRATION AND TRAINING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

- 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.

- B. Related Sections include the following:

- 1. Divisions 02 through 33 Sections for specific requirements for demonstration and training for products in those Sections.

**1.3 SUBMITTALS**

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

- 1. At completion of training, submit one complete training manual for Owner's use.

- B. Attendance Record: For each training module, submit list of participants and length of instruction time.

**1.4 COORDINATION**

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

**PART 2 - PRODUCTS****2.1 INSTRUCTION PROGRAM**

- A. Program Structure: Develop an instruction program that includes training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
1. Fire-protection systems, including fire alarm and fire-extinguishing systems.
  2. Intrusion detection systems.
  3. HVAC systems.
  4. Electrical service and distribution, including transformers, switchboards and panelboards.
  5. Lighting equipment and controls.
  6. Communication systems, including intercommunication, surveillance, voice and data and television equipment.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Operations manuals.
    - c. Maintenance manuals.
    - d. Project Record Documents.
    - e. Identification systems.
    - f. Warranties and bonds.
    - g. Maintenance service agreements and similar continuing commitments.
  3. Emergencies: Include the following, as applicable:
    - a. Instructions on meaning of warnings, trouble indications, and error messages.
    - b. Instructions on stopping.
    - c. Shutdown instructions for each type of emergency.
    - d. Operating instructions for conditions outside of normal operating limits.
    - e. Sequences for electric or electronic systems.
    - f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

- a. Startup procedures.
- b. Equipment or system break-in procedures.
- c. Routine and normal operating instructions.
- d. Regulation and control procedures.
- e. Control sequences.
- f. Safety procedures.
- g. Instructions on stopping.
- h. Normal shutdown instructions.
- i. Operating procedures for emergencies.
- j. Operating procedures for system, subsystem, or equipment failure.
- k. Seasonal and weekend operating instructions.
- l. Required sequences for electric or electronic systems.
- m. Special operating instructions and procedures.

5. Adjustments: Include the following:

- a. Alignments.
- b. Checking adjustments.
- c. Noise and vibration adjustments.
- d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

- a. Diagnostic instructions.
- b. Test and inspection procedures.

7. Maintenance: Include the following:

- a. Inspection procedures.
- b. Types of cleaning agents to be used and methods of cleaning.
- c. List of cleaning agents and methods of cleaning detrimental to product.
- d. Procedures for routine cleaning
- e. Procedures for preventive maintenance.
- f. Procedures for routine maintenance.
- g. Instruction on use of special tools.

8. Repairs: Include the following:

- a. Diagnosis instructions.
- b. Repair instructions.
- c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
- d. Instructions for identifying parts and components.
- e. Review of spare parts needed for operation and maintenance.

**PART 3 - EXECUTION****3.1 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
- B. Set up instructional equipment at instruction location.

**3.2 INSTRUCTION**

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Owner will furnish an instructor to describe Owner's operational philosophy.
  - 2. Owner will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule training with Owner with at least seven days' advance notice.
- C. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 01 82 00

**SECTION 02 41 19 - SELECTIVE DEMOLITION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

- B. Related Requirements:

1. Division 01, Section "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Division 01, Section "Execution" for cutting and patching procedures.
3. Division 31, Section "Site Clearing" for site clearing and removal of above- and below-grade improvements.

**1.3 DEFINITIONS**

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, 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 items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

**1.4 MATERIALS OWNERSHIP**

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

## 1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
  - 1. Inspect and discuss condition of construction to be selectively demolished.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
  - 5. Review areas where existing construction is to remain and requires protection.

## 1.6 SUBMITTALS

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and , for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
  - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Predemolition Photographs or Video: Submit before Work begins.

## 1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

## 1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

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

#### 1.9 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

### PART 2 - PRODUCTS

#### 2.1 PEFORMANCE REQUIREMENTS

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

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
  - 1. Comply with requirements specified in Division 01, Section "Photographic Documentation."
  - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.

### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
  - 1. Comply with requirements for existing services/systems interruptions specified in Division 01, Section "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
  - 1. Arrange to shut off indicated utilities with utility companies.
  - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
    - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
    - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
    - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

### 3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Comply with requirements for access and protection specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
  - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01, Section "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.

### 3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.

5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. Comply with requirements in Division 01, Section "Construction Waste Management and Disposal."

B. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RCFI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.

1. Remove existing roof membrane, flashings, copings, and roof accessories.
2. Remove existing roofing system down to substrate.

### 3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

### 3.7 CLEANING

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

END OF SECTION 02 41 19

**SECTION 03 30 53 - MISCELLANEOUS CAST-IN-PLACE CONCRETE****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes but is not limited to:

- 1. Cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
    - a. Footings
    - b. Foundation walls
    - c. Slab-on-grade

- B. Related Sections:

- 1. Division 31, Section "Earth Moving" for drainage fill under slabs-on-grade.
  - 2. Division 32, Section "Concrete Paving" for concrete pavement and walks.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture.

**1.4 QUALITY ASSURANCE**

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. Comply with the following sections of ACI 301 (ACI 301M), unless modified by requirements in the Contract Documents:
  - 1. "General Requirements."
  - 2. "Formwork and Formwork Accessories."
  - 3. "Reinforcement and Reinforcement Supports."
  - 4. "Concrete Mixtures."
  - 5. "Handling, Placing, and Constructing."

- C. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

## PART 2 - PRODUCTS

### 2.1 FORMWORK

- A. Furnish formwork and formwork accessories according to ACI 301 (ACI 301M).

### 2.2 STEEL REINFORCEMENT

- 1. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 60 percent.
- B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- C. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.
- D. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, fabricated from as-drawn steel wire into flat sheets.
- E. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

### 2.3 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout Project:
  - 1. Portland Cement: ASTM C 150, Type I. Supplement with the following:
    - a. Fly Ash: ASTM C 618, Class C or F.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregate: ASTM C 33, graded, 3/4 inch (19mm) nominal maximum aggregate size.
- C. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C 94/C 94M.

### 2.4 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those

permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

## 2.5 VAPOR BARRIERS

- A. Sheet Vapor Barrier: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Fortifiber Building Systems Group; Moistop Ultra 15.
    - b. Reef Industries, Inc.; Griffolyn 15 mil Green.
    - c. Stego Industries, LLC; Stego Wrap 15 mil Class A.

## 2.6 RELATED MATERIALS

- A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

## 2.7 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth or cotton mats.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

## 2.8 CONCRETE MIXTURES

- A. Comply with ACI 301 (ACI 301M) requirements for concrete mixtures.
- B. Normal-Weight Concrete: Prepare design mixes, proportioned according to ACI 301 (ACI 301M), as follows:
1. Minimum Compressive Strength: As indicated on Drawings at 28 days.
  2. Maximum Water-Cementitious Materials Ratio: As indicated on Drawings.

3. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
4. Slump Limit: As indicated on Drawings, plus or minus 1 inch (25 mm).
5. Air Content: Maintain within range permitted by ACI 301 (ACI 301M). Do not allow air content of trowel-finished floor slabs to exceed 3 percent.

## 2.9 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116, and furnish batch ticket information.
  1. When air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

# PART 3 - EXECUTION

## 3.1 FORMWORK

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301 (ACI 301M).
- B. Chamfer exterior corners and edges of permanently exposed concrete  $\frac{3}{4}$  inches.

## 3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

## 3.3 VAPOR BARRIERS

- A. Install, protect, and repair vapor retarders according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.
  1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended adhesive or joint tape.

## 3.4 STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
  1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

### 3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Locate and install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:
  - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
  - 2. Sawed Joints: Where indicated on Drawings form contraction joints with early entry power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
    - a. Chamfer edges of sawed joints in exposed locations.
- D. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
  - 1. Extend joint fillers full width of joint. and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

### 3.6 CONCRETE PLACEMENT

- A. Comply with ACI 301 (ACI 301M) for placing concrete.
- B. Do not add water to concrete during delivery, at Project site, or during placement.
- C. Consolidate concrete with mechanical vibrating equipment.

### 3.7 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding 1/2 inch (13 mm).
  - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch (3 mm).
  - 1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

- C. Rubbed Finish: Apply the following rubbed finish, defined in ACI 301 (ACI 301M), to smooth-formed finished as-cast concrete where indicated:
  - 1. Smooth-rubbed finish.
  - 2. Grout-cleaned finish.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.8 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on surface.
  - 1. Do not further disturb surfaces before starting finishing operations.
- C. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, fluid-applied or direct-to-deck-applied membrane roofing, or sand-bed terrazzo.
- D. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

### 3.9 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with ACI 301 (ACI 301M) for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching  $0.2 \text{ lb/sq. ft.} \times \text{h}$  ( $1 \text{ kg/sq. m} \times \text{h}$ ) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- D. Curing Methods: Cure formed and unformed concrete for at least seven days by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

- a. Water.
  - b. Continuous water-fog spray.
  - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
  4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Tests: Perform according to ACI 301 (ACI 301M).
  1. Testing Frequency: One composite sample shall be obtained for each day's pour of each concrete mix exceeding 5 cu. yd. (4 cu. m) but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
  2. Testing Frequency: One composite sample shall be obtained for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mix placed each day.

### 3.11 REPAIRS

- A. Remove and replace concrete that does not comply with requirements in this Section.

END OF SECTION 03 30 53

**SECTION 03 45 00 - PRECAST ARCHITECTURAL CONCRETE****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

- 1. Architectural precast concrete decking.

- B. Related Requirements:

- 1. Division 01, Section "Quality Requirements" for administrative requirements for preinstallation meetings.
  - 2. Division 01, Section "Delegated Design and Deferred Submittal Requirements" for administrative requirements for delegated design services required.
  - 3. Division 05, Section "Metal Fabrications" for connections to wood structure.

**1.3 DEFINITIONS**

- A. Design Reference Sample: Sample of approved architectural precast concrete color, finish and texture, preapproved by Architect.

**1.4 PREINSTALLATION MEETINGS**

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

**1.5 SUBMITTALS**

- A. Product Data: For each type of product.
- B. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.
- C. Shop Drawings:
  - 1. Detail fabrication and installation of architectural precast concrete units.
  - 2. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.
  - 3. Indicate joints, reveals, drips, chamfers, and extent and location of each surface finish.

4. Indicate type, size, and length of welded connections by AWS standard symbols. Detail loose and cast-in hardware and connections.
  5. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
  6. Indicate location of each architectural precast concrete unit by same identification mark placed on panel.
  7. Indicate relationship of architectural precast concrete units to adjacent materials.
  8. Indicate locations, dimensions, and details of anchors, and joint widths.
  9. If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.
- D. Samples: Design reference samples for initial verification of design intent, for each type of finish indicated on exposed surfaces of architectural precast concrete units, representative of finish, color, and texture expected; approximately 12 by 12 by 2 inches (300 by 300 by 50 mm).
- E. Delegated-Design Submittal: For architectural precast concrete indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Show governing panel types, connections, types of reinforcement, including special reinforcement, and concrete cover on reinforcement. Indicate location, type, magnitude, and direction of loads imposed on the building structural frame from architectural precast concrete.
- F. Qualification Data: For Installer and fabricator.
- G. Field quality-control and special inspection reports.

## 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- C. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products."
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel"; and AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel."

- E. Mockups: After sample panel approval but before production of architectural precast concrete units, construct full-sized mockup to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution.
1. Build mockup of one deck section as indicated, complete with anchors and connections.
  2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

#### 1.7 COORDINATION

- A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground or other rehandling.
- B. Support units during shipment on nonstaining shock-absorbing material.
- C. Store units with adequate dunnage and bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.
- D. Place stored units so identification marks are clearly visible, and units can be inspected.
- E. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.
- F. Lift and support units only at designated points indicated on Shop Drawings.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design architectural precast concrete units.
- B. Design Standards: Comply with ACI 318 (ACI 318M) and design recommendations of PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of architectural precast concrete units indicated.
- C. Calculated Fire-Test-Response Characteristics: Provide architectural precast concrete units with fire-resistance rating indicated as calculated according to ACI 216.1 (ACI 216.1M)

PCI MNL 124, "Design for Fire Resistance of Precast Prestressed Concrete," and acceptable to authorities having jurisdiction.

- D. Structural Performance: Provide architectural precast concrete units and connections capable of withstanding the following design loads within limits and under conditions indicated:
1. Loads: As indicated on Drawings.
  2. Design precast concrete units and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, to accommodate live-load deflection, shrinkage and creep of primary building structure, and other building movements.
  3. Thermal Movements: Provide for in-plane thermal movements resulting from annual ambient temperature changes of 80 deg F (26 deg C) 120 deg F (67 deg C).
  4. Fire-Resistance Rating: Select material and minimum thicknesses to provide 1-hour fire rating.

## 2.2 MOLD MATERIALS

- A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that provides continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.
1. Mold-Release Agent: Commercially produced form-release agent that does not bond with, stain or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

## 2.3 REINFORCING MATERIALS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 60 percent.
- B. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- C. Galvanized Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) ASTM A 706/A 706M, deformed bars, with ASTM A 767/A 767M, Class II zinc coating and chromate treatment. Galvanize after fabrication and bending.
- D. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 117.

## 2.4 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or Type III, gray, unless otherwise indicated.
1. For surfaces exposed to view in finished structure, use gray or white cement, of same type, brand, and mill source.
- B. Supplementary Cementitious Materials:

1. Fly Ash: ASTM C 618, Class C or F, with maximum loss on ignition of 3 percent.
  2. Metakaolin: ASTM C 618, Class N.
  3. Silica Fume: ASTM C 1240, with optional chemical and physical requirement.
  4. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
  5. Blended Hydraulic Cement: ASTM C 595, cement.
- C. Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C 33/C 33M, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
- a. Gradation: Uniformly graded.
2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand compatible with coarse aggregate; to match approved finish sample.
- D. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.
- E. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.
1. Water-Reducing Admixtures: ASTM C 494/C 494M, Type A.
  2. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  3. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.
  4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  5. Corrosion Inhibiting Admixture: ASTM C 1582/C 1582M.

## 2.5 STEEL CONNECTION MATERIALS

- A. Carbon-Steel Shapes and Plates: ASTM A 36/A 36M.
- B. Carbon-Steel-Headed Studs: ASTM A 108, AISI 1018 through AISI 1020, cold finished, AWS D1.1/D1.1M, Type A or Type B, with arc shields and with minimum mechanical properties of PCI MNL 117, Table 3.2.3.
- C. Carbon-Steel Plate: ASTM A 283/A 283M, Grade C.
- D. Malleable Iron Castings: ASTM A 47/A 47M, Grade 32510 or Grade 35028.
- E. Carbon-Steel Castings: ASTM A 27/A 27M, Grade 60-30 (Grade 415-205).
- F. High-Strength, Low-Alloy Structural Steel: ASTM A 572/A 572M.
- G. Carbon-Steel Structural Tubing: ASTM A 500/A 500M, Grade B or Grade C.
- H. Wrought Carbon-Steel Bars: ASTM A 675/A 675M, Grade 65 (Grade 450).

- I. Deformed-Steel Wire or Bar Anchors: ASTM A 496/A 496M or ASTM A 706/A 706M.
- J. Carbon-Steel Bolts and Studs: ASTM A 307, Grade A or ASTM F 1554, Grade 36 (ASTM F 568M, Property Class 4.6); carbon-steel, hex-head bolts and studs; carbon-steel nuts, ASTM A 563 (ASTM A 563M); and flat, unhardened steel washers, ASTM F 844.
- K. Zinc-Coated Finish: For exterior steel items and items indicated for galvanizing, apply zinc coating by hot-dip process according to ASTM A 123/A 123M or ASTM A 153/A 153M.
  - 1. For steel shapes, plates, and tubing to be galvanized, limit silicon content of steel to less than 0.03 percent or to between 0.15 and 0.25 percent or limit sum of silicon and 2.5 times phosphorous content to 0.09 percent.
  - 2. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035B or SSPC-Paint 20.
- L. Welding Electrodes: Comply with AWS standards.

## 2.6 BEARING PADS

- A. Provide one of the following bearing pads for architectural precast concrete units as recommended by precast fabricator for application:

## 2.7 ACCESSORIES

- A. Precast Accessories: Provide clips, hangers, high-density plastic or steel shims, and other accessories required to install architectural precast concrete units.

## 2.8 CONCRETE MIXTURES

- A. Prepare design mixtures for each type of precast concrete required.
  - 1. Use a single design mixture for units with more than one major face or edge exposed.
  - 2. Where only one face of unit is exposed use either a single design mixture or separate mixtures for face and backup.
- B. Limit use of fly ash and ground granulated blast-furnace slag to 20 percent of portland cement by weight; limit metakaolin and silica fume to 10 percent of portland cement by weight.
- C. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.
- D. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 (ACI 318M) or PCI MNL 117 when tested according to ASTM C 1218/C 1218M.
- E. Normal-Weight Concrete Mixtures: Proportion face and backup mixtures or full-depth mixtures, at fabricator's option by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 5000 psi (34.5 MPa) minimum.
  2. Maximum Water-Cementitious Materials Ratio: 0.45.
- F. Water Absorption: 6 percent by weight or 14 percent by volume, tested according to ASTM C 642, except for boiling requirement.
- G. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 117.
- H. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

## 2.9 MOLD FABRICATION

- A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of reinforcement by release agent.
1. Place form liners accurately to provide finished surface texture indicated. Provide solid backing and supports to maintain stability of liners during concrete placement. Coat form liner with form-release agent.
- B. Maintain molds to provide completed architectural precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.
1. Form joints are not permitted on faces exposed to view in the finished work.
  2. Edge and Corner Treatment: Uniformly chamfered.

## 2.10 FABRICATION

- A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.
1. Weld-headed studs and deformed bar anchors used for anchorage according to AWS D1.1/D1.1M and AWS C5.4, "Recommended Practices for Stud Welding."
- B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing architectural precast concrete units to supporting and adjacent construction.
- C. Cast-in reglets, slots, holes, and other accessories in architectural precast concrete units as indicated on the Contract Drawings.
- D. Cast-in openings larger than 10 inches (250 mm) in any dimension. Do not drill or cut openings without Architect's approval.

- E. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement.
  - 1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete. When damage to epoxy-coated reinforcing exceeds limits specified in ASTM A 775/A 775M, repair with patching material compatible with coating material and epoxy coat bar ends after cutting.
  - 2. Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.
  - 3. Place reinforcing steel to maintain at least 3/4-inch (19-mm) minimum concrete cover. Increase cover requirements for reinforcing steel to 1-1/2 inches (38 mm) when units are exposed to corrosive environment or severe exposure conditions. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.
  - 4. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh spacing and wire tie laps, where required by design. Offset laps of adjoining widths to prevent continuous laps in either direction.
- F. Reinforce architectural precast concrete units to resist handling, transportation, and erection stresses and specified in-place loads.
- G. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.
- H. Place face mixture to a minimum thickness after consolidation of the greater of 1 inch (25 mm) or 1.5 times the maximum aggregate size, but not less than the minimum reinforcing cover specified.
- I. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.
  - 1. Place backup concrete mixture to ensure bond with face-mixture concrete.
- J. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 117.
  - 1. Place self-consolidating concrete without vibration according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants." Ensure adequate bond between face and backup concrete, if used.
- K. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.
- L. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that does not show in finished structure.

- M. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.
- N. Discard and replace architectural precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 117 and Architect's approval.

## 2.11 FABRICATION TOLERANCES

- A. Fabricate architectural precast concrete units to shapes, lines, and dimensions indicated so each finished unit complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.
- B. Fabricate architectural precast concrete units to shapes, lines, and dimensions indicated so each finished unit complies with the following product tolerances:
  1. Overall Height and Width of Units, Measured at the Face Exposed to View: As follows:
    - a. 10 feet (3 m) or under, plus or minus 1/8 inch (3 mm).
    - b. 10 to 20 feet (3 to 6 m), plus 1/8 inch (3 mm), minus 3/16 inch (5 mm).
    - c. 20 to 40 feet (6 to 12 m), plus or minus 1/4 inch (6 mm).
    - d. Each additional 10 feet (3 m), plus or minus 1/16 inch (1.5 mm).
  2. Overall Height and Width of Units, Measured at the Face Not Exposed to View: As follows:
    - a. 10 feet (3 m) or under, plus or minus 1/4 inch (6 mm).
    - b. 10 to 20 feet (3 to 6 m), plus 1/4 inch (6 mm), minus 3/8 inch (10 mm).
    - c. 20 to 40 feet (6 to 12 m), plus or minus 3/8 inch (10 mm).
    - d. Each additional 10 feet (3 m), plus or minus 1/8 inch (3 mm).
  3. Total Thickness or Flange Thickness: Plus 1/4 inch (6 mm), minus 1/8 inch (3 mm).
  4. Variation from Square or Designated Skew (Difference in Length of the Two Diagonal Measurements): Plus or minus 1/8 inch/72 inches (3 mm/1830 mm) or 1/2 inch (13 mm) total, whichever is greater.
  5. Length and Width of Block-outs and Openings within One Unit: Plus or minus 1/4 inch (6 mm).
  6. Bowing: Plus or minus L/360.
  7. Local Smoothness: 1/4 inch/10 feet (6 mm/3 m).
  8. Warping: 1/16 inch/12 inches (1.5 mm/300 mm) of distance from nearest adjacent corner.
  9. Tipping and Flushness of Plates: Plus or minus 1/4 inch (6 mm).
- C. Position Tolerances: For cast-in items measured from datum line location, as indicated on Shop Drawings.
  1. Weld Plates: Plus or minus 1 inch (25 mm).
  2. Inserts: Plus or minus 1/2 inch (13 mm).
  3. Handling Devices: Plus or minus 3 inches (75 mm).

4. Reinforcing Steel and Welded Wire Reinforcement: Plus or minus 1/4 inch (6 mm) where position has structural implications or affects concrete cover; otherwise, plus or minus 1/2 inch (13 mm).
5. Reinforcing Steel Extending out of Member: Plus or minus 1/2 inch (13 mm) of plan dimensions.
6. Location of Opening within Panel: Plus or minus 1/4 inch (6 mm).
7. Location of Flashing Reglets: Plus or minus 1/4 inch (6 mm).
8. Location of Flashing Reglets at Edge of Panel: Plus or minus 1/8 inch (3 mm).
9. Location of Bearing Surface from End of Member: Plus or minus 1/4 inch (6 mm).
10. Allowable Rotation of Plate, Channel Inserts, and Electrical Boxes: 2-degree rotation or 1/4 inch (6 mm) maximum over the full dimension of unit.
11. Position of Sleeve: Plus or minus 1/2 inch (13 mm).

## 2.12 FINISHES

- A. Exposed faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform, straight, and sharp. Finish exposed-face surfaces of architectural precast concrete units to match approved sample panels and as follows:
  1. As-Cast Surface Finish: Provide surfaces to match approved sample for acceptable surface, air voids, sand streaks, and honeycomb.
- B. Finish exposed top surfaces of architectural precast concrete units to match face-surface finish.
- C. Finish unexposed surfaces of architectural precast concrete units with as cast finish.

## 2.13 SOURCE QUALITY CONTROL

- A. Quality-Control Testing: Test and inspect precast concrete according to PCI MNL 117 requirements. If using self-consolidating concrete, also test and inspect according to PCI TR-6, ASTM C 1610/C 1610M, ASTM C 1611/C 1611M, ASTM C 1621/C 1621M, and ASTM C 1712.
- B. Owner will employ an independent testing agency to evaluate architectural precast concrete fabricator's quality-control and testing methods.
  1. Allow Owner's testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with Owner's testing agency and provide samples of materials and concrete mixtures as may be requested for additional testing and evaluation.
- C. Strength of precast concrete units is considered deficient if units fail to comply with ACI 318 (ACI 318M) requirements for concrete strength.
- D. Testing: If there is evidence that strength of precast concrete units may be deficient or may not comply with ACI 318 (ACI 318M) requirements, precaster will employ an independent testing agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C 42/C 42M and ACI 318 (ACI 318M).

1. A minimum of three representative cores shall be taken from units of suspect strength, from locations directed by Architect.
  2. Test cores in an air-dry condition.
  3. Strength of concrete for each series of three cores is considered satisfactory if average compressive strength is equal to at least 85 percent of 28-day design compressive strength and no single core is less than 75 percent of 28-day design compressive strength.
  4. Report test results in writing on same day that tests are performed, with copies to Architect, Contractor, and precast concrete fabricator. Test reports include the following:
    - a. Project identification name and number.
    - b. Date when tests were performed.
    - c. Name of precast concrete fabricator.
    - d. Name of concrete testing agency.
    - e. Identification letter, name, and type of precast concrete unit(s) represented by core tests; design compressive strength; type of break; compressive strength at breaks, corrected for length-diameter ratio; and direction of applied load to core in relation to horizontal plane of concrete as placed.
- E. Patching: If core test results are satisfactory and precast concrete units comply with requirements, clean and dampen core holes and solidly fill with precast concrete mixture that has no coarse aggregate, and finish to match adjacent precast concrete surfaces.
- F. Defective Units: Discard and replace recast architectural concrete units that do not comply with acceptability requirements in PCI MNL 117, including concrete strength, manufacturing tolerances, and color and texture range. Chipped, spalled, or cracked units may be repaired, subject to Architect's approval. Architect reserves the right to reject precast units that do not match approved samples, sample panels, and mockups. Replace unacceptable units with precast concrete units that comply with requirements.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, bearing surface tolerances, and other conditions affecting performance of the Work.
- B. Do not install precast concrete units until supporting structure is structurally ready to receive loads from precast concrete units.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Install clips, hangers, bearing pads, and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.

- B. Erect architectural precast concrete level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment of units until permanent connections are completed.
1. Install temporary steel or plastic spacing shims as precast concrete units are being erected. Tack weld steel shims to each other to prevent shims from separating.
  2. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
  3. Remove projecting lifting devices and grout fill voids within recessed lifting devices flush with surface of adjacent precast surfaces when recess is exposed.
  4. Unless otherwise indicated, maintain uniform joint widths of 3/8 inch (19 mm).
- C. Connect architectural precast concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.
1. Do not permit connections to disrupt continuity of roof, deck or wall flashing.
- D. Welding: Comply with applicable requirements in AWS D1.1/D1.1M and AWS D1.4/D1.4M for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.
1. Protect architectural precast concrete units and bearing pads from damage by field welding or cutting operations, and provide noncombustible shields as required.
  2. Welds not specified shall be continuous fillet welds, using no less than the minimum fillet as specified by AWS.
  3. Clean weld-affected metal surfaces with chipping hammer followed by brushing, and apply a minimum 4.0-mil- (0.1-mm-) thick coat of galvanized repair paint to galvanized surfaces according to ASTM A 780/A 780M.
  4. Clean weld-affected metal surfaces with chipping hammer followed by brushing, and reprime damaged painted surfaces.
  5. Visually inspect welds and remove, reweld, or repair incomplete and defective welds.
- E. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.
1. Where slotted connections are used, verify bolt position and tightness. For sliding connections, properly secure bolt but allow bolt to move within connection slot.
  2. For slip-critical connections, use one of the following methods to assure proper bolt pretension:
    - a. Turn-of-Nut: According to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
    - b. Calibrated Wrench: According to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
    - c. Twist-off Tension Control Bolt: ASTM F 1852.
    - d. Direct-Tension Control Bolt: ASTM F 1852.
  3. For slip-critical connections, use method and inspection procedure approved by Architect and coordinated with inspection agency.

F. Grouting or Dry-Pack Connections and Joints: Grout connections where required or indicated. Retain flowable grout in place until hard enough to support itself. Alternatively, pack spaces with stiff dry-pack grout material, tamping until voids are completely filled. Place grout and finish smooth, level, and plumb with adjacent concrete surfaces. Promptly remove grout material from exposed surfaces before it affects finishes or hardens. Keep grouted joints damp for not less than 24 hours after initial set.

### 3.3 ERECTION TOLERANCES

- A. Erect architectural precast concrete units level, plumb, square, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 117, Appendix I.
- B. Erect architectural precast concrete units level, plumb, square, and in alignment, without exceeding the following noncumulative erection tolerances:
  1. Plan Location from Building Grid Datum: Plus or minus 1/2 inch (13 mm).
  2. Top Elevation from Nominal Top Elevation: As follows:
    - a. Exposed Individual Panel: Plus or minus 1/4 inch (6 mm).
    - b. Exposed Panel Relative to Adjacent Panel: 1/4 inch (6 mm).
  3. Support Elevation from Nominal Support Elevation: As follows:
    - a. Maximum Low: 1/2 inch (13 mm).
    - b. Maximum High: 1/4 inch (6 mm).
  4. Maximum Jog in Alignment of Matching Edges: 1/8 inch (6 mm).
  5. Joint Width (Governs over Joint Taper): 3/8 inch (6 mm) maximum.
  6. Maximum Joint Taper: 3/8 inch (10 mm).
  7. Joint Taper in 10 Feet (3 m): 1/4 inch (6 mm).
  8. Maximum Jog in Alignment of Matching Faces: 1/4 inch (6 mm).
  9. Differential Bowing or Camber, as Erected, between Adjacent Members of Same Design: 1/4 inch (6 mm).

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Visually inspect field welds and test according to ASTM E 165 or to ASTM E 709 and ASTM E 1444. High-strength bolted connections are subject to inspections.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Repair or remove and replace work where tests and inspections indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, shall be performed to determine compliance of replaced or additional work with specified requirements.

### 3.5 REPAIRS

- A. Repair architectural precast concrete units if permitted by Architect. Architect reserves the right to reject repaired units that do not comply with requirements.
- B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet (6 m).
- C. Prepare and repair damaged galvanized coatings with galvanizing repair paint according to ASTM A 780/A 780M.
- D. Wire brush, clean, and paint damaged prime-painted components with same type of shop primer.
- E. Remove and replace damaged architectural precast concrete units when repairs do not comply with requirements.

### 3.6 CLEANING

- A. Clean surfaces of precast concrete units exposed to view.
- B. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.
- C. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.
  - 1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.
  - 2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 03 45 00

**SECTION 03 45 10 – PRECAST CONCRETE STAIR TREADS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes but is not limited to:

1. Precast concrete stair treads.
2. Supports, anchors, and attachments.

- B. Related Sections include the following:

1. Division 01, Section "Quality Requirements" for administrative requirements for preinstallation meetings.
2. Division 01, Section "Delegated Design and Deferred Submittal Requirements" for administrative requirements for delegated design services required.
3. Division 06, Section "Rough Carpentry" for connections to wood stair stringers.

**1.3 PERFORMANCE REQUIREMENTS**

- A. Structural Requirements: Design treads and attachments to withstand design live loads of 200 p.s.f., point load of 500 lbs. and deflection of L/360.

- B. Accessibility Requirements: Comply with applicable provisions of:

1. Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," and ANSI A117.1.
2. Current Oregon Structural Specialty Code (OSSC), Chapter 11: Accessibility.

**1.4 SUBMITTALS**

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

- B. Shop Drawings: Detail fabrication and installation of stair tread units. Indicate member locations, plans, elevations, dimensions, shapes, cross sections, finish, and types of reinforcement, including special reinforcement.

- C. Delegated-Design Submittal: For precast concrete stair treads indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Show connections, types of reinforcement, including special reinforcement, and concrete cover on reinforcement. Indicate location, type, magnitude, and direction of loads imposed on the structural frame from precast concrete stair treads.

- D. Calculations: Provide structural calculations showing compliance with design criteria and all applicable codes.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed precast architectural concrete work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Fabricator Qualifications: A firm that is experienced in manufacturing precast architectural concrete units similar to those indicated for this Project and with a record of successful in-service performance.
- C. Design Standards: Comply with ACI 318 and the design recommendations of PCI MNL 120, "PCI Design Handbook--Precast and Prestressed Concrete."

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver stair tread units to Project site in such quantities and at such times to ensure continuity of installation.
- B. Store units at Project site to prevent cracking, distorting, warping, staining, or other physical damage, and so markings are visible.

#### 1.7 WARRANTY

- A. Provide manufacturer's standard five year warranty against defects in materials and workmanship.

#### 1.8 SEQUENCING

- A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

### PART 2 - PRODUCTS

#### 2.1 CONCRETE TREAD MATERIALS

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Portland Cement: ASTM C 150, Type I or Type III, gray, of same type, brand, and source.
- C. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.
- D. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- E. Water-Reducing Admixture: ASTM C 494, Type A.

## 2.2 STEEL CONNECTION MATERIALS

- A. Carbon-Steel Shapes and Plates: ASTM A 36/A 36M.
- B. Finish: Apply zinc coating by hot-dip process according to ASTM A 123/A 123M, after fabrication, and ASTM A 153/A 153M, as applicable.
  - 1. Ledgers, Angles, threaded inserts, inserts, bolts, washers and lag bolts.
  - 2. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035A or SSPC-Paint 20.
- C. Welding Electrodes: Comply with AWS standards.

## 2.3 CONCRETE MIXES

- A. Concrete: Minimum 5000 p.s.i., 28 day strength, air entrained to 5 – 7 percent in accordance with ANSI/ACI 301.
- B. Design mixes may be prepared by a qualified independent testing agency or by qualified precast plant personnel at precast architectural concrete fabricator's option.
- C. Limit water-soluble chloride ions to the maximum percentage by weight of cement permitted by ACI 318.
- D. When included in design mixes, add other admixtures to concrete mixes according to manufacturer's written instructions.

## 2.4 PRECAST CONCRETE CLOSED RISER STEPTREAD

- A. Products:
  - 1. Manufacturer:
    - a. Stepstone, Inc. 'Steptread' closed riser step with integral riser.
      - 1) 'Classic Profile'
  - 2. Dimensions: 12 inches by 7 ¾ inches. Lengths as required to match existing.
  - 3. Locations: As indicated on drawings.
  - 4. Color: As selected by Architect from manufacturer's standard range of colors.
- B. Fabricate stair treads to the cross section shown on drawings and to match existing tread profile. Verify compliance with accessibility requirements indicated above.
- C. Cast-in Anchors, Plates Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.

- D. Furnish loose steel plates, seat angles, anchors and other hardware shapes for securing precast stair tread units to supporting and adjacent construction. Reconfigure existing supports for new treads as required.
- E. Mix concrete according to PCI MNL 117 and requirements in this Section. After concrete batching, no additional water may be added.
- F. Cure concrete, according to requirements in PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture.
- G. Finish top surface of stair treads with slip resistant broom finish.
- H. Discard stair tread units that are warped, cracked, broken, spalled, stained, or otherwise defective. Inconsistent surface color will be considered defective.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances, true and level bearing surfaces, and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Install angles and other support hardware required for connecting precast stair tread units to supporting members and backup materials.
- B. Install stair treads without damage to shape or finish. Replace damaged treads.
- C. Provide separation between concrete tread and steel support angle using one layer of 30 lb. roofing felt. Trim roofing felt to fit contact surface of angle, so that no felt is exposed to view.
- D. Anchor stair treads in position by welding. Perform welding in compliance with AWS D1.1 and AWS D1.4, with qualified welders.
  - 1. Protect precast stair treads and stringers from damage by field welding or cutting operations and provide noncombustible shields as required.
  - 2. Repair damaged steel surfaces by cleaning and applying a coat of galvanizing repair paint to galvanized surfaces.

#### 3.3 CLEANING AND REPAIRS

- A. Remove and replace damaged precast stair tread units if repairs do not comply with requirements.
- B. Clean exposed surfaces of precast concrete units after erection to remove weld marks, other markings, dirt, and stains.

END OF SECTION 03 45 10

**SECTION 05 50 00 - METAL FABRICATIONS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

- 1. Miscellaneous steel framing and supports, as shown on drawings.

- B. Products furnished, but not installed, under this Section:

- 1. Anchor bolts.

- C. Related Sections:

- 1. Division 03, Section "Miscellaneous Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, and other items cast into concrete.
  - 2. Division 03, Section "Precast Architectural Concrete" for installing, inserts, angles and other items cast in concrete.
  - 3. Division 05, Section "Pipe and Tube Railings."

**1.3 PERFORMANCE REQUIREMENTS**

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

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

**1.4 SUBMITTALS**

- A. Product Data: For the following:

- 1. Grout.
  - 2. Hinges

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

- 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

- C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Qualification Data: For qualified professional engineer.
- E. Welding certificates.
- F. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

## 1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
  1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

## 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

## 1.7 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages and steel weld plates and angles for casting into concrete. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

# PART 2 - PRODUCTS

## 2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

## 2.2 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500, cold-formed steel tubing.
- C. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40) unless otherwise indicated.
- D. Silicon content: Limit silicone content of steel for galvanizing to less than 0.04 percent.
- E. Phosphorus content: Limit phosphorus content of steel for galvanizing to less than 0.02 percent.

## 2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners or hot-dipped galvanized fasteners for exterior use. Select fasteners for type, grade, and class required.
  - 1. Provide stainless-steel fasteners for fastening aluminum.
  - 2. Provide stainless-steel fasteners for fastening stainless steel.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
- C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593 (ASTM F 738M); with hex nuts, ASTM F 594 (ASTM F 836M); and, where indicated, flat washers; Alloy Group 1.
- D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
  - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- E. Eyebolts: ASTM A 489.
- F. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).
- G. Lag Screws: ASME B18.2.1 (ASME B18.2.3.8M).
- H. Wood Screws: Flat head, ASME B18.6.1.
- I. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).
- J. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).
- K. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

- L. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
- M. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
  - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
  - 2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

## 2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and containing a minimum of 95% metallic zinc and compatible with paints specified to be used over it.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- F. Concrete: Comply with requirements in Division 03, Section "Miscellaneous Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).

## 2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate and as required by galvanizing.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
  - 1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.
- J. Hot dip galvanize all ferrous metal fabrications exposed to weather, outside the thermal envelope of the building, in high humidity areas and/or when indicated on the drawings.

## 2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

## 2.7 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Finish metal fabrications after assembly.
- C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

## 2.8 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
  - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
  - 2. All steel fabrications exposed to the weather shall be hot dip galvanized.
  - 3. Prepare galvanized finish for "Painting" as indicated in that section.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of racking; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

### 3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for operable partitions securely to and rigidly brace from building structure.

### 3.3 ADJUSTING AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.
  1. Apply by brush or spray an organic zinc-rich coating containing 95% metallic zinc, by weight in the dried film; provide a minimum 3.0-mil (0.05-mm) dry film thickness.
  2. Fill drain holes with zinc plugs and file smooth.

END OF SECTION 05 50 00

**SECTION 05 52 13 - PIPE AND TUBE RAILINGS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Steel pipe and tube railings.
2. Handrail fittings

- B. Related Sections:

1. Division 01, Section "Quality Requirements" for administrative requirements for preinstallation meetings.
2. Division 01, Section "Delegated Design and Deferred Submittal Requirements" for administrative requirements for delegated design services required.
3. Division 03, Section "Miscellaneous Cast-In-Place Concrete" for steel attachment at concrete.
4. Division 06, Section "Rough Carpentry" for wood blocking for anchoring railings.

**1.3 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

- B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

1. Steel: 72 percent of minimum yield strength.
2. Aluminum: The lesser of minimum yield strength divided by 1.65 or minimum ultimate tensile strength divided by 1.95.
3. Stainless Steel: 60 percent of minimum yield strength.

- C. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

- a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
- b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
- c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:
  - a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
  - b. Infill load and other loads need not be assumed to act concurrently.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
  1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- E. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

#### 1.4 SUBMITTALS

- A. Product Data: For the following:
  1. Railing brackets.
  2. Grout and anchoring cement.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Qualification Data: For qualified professional engineer.
- E. Welding certificates.
- F. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers or galvanizing certifying that shop primers and galvanizing are compatible with topcoats.

#### 1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of railing from single source from single manufacturer.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
  1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
  3. AWS D1.6, "Structural Welding Code - Stainless Steel."

**1.6 PROJECT CONDITIONS**

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

**1.7 COORDINATION AND SCHEDULING**

- A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

**PART 2 - PRODUCTS****2.1 METALS, GENERAL**

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

**2.2 STEEL AND IRON**

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Tubing: ASTM A 500 (cold formed) or ASTM A 513.
- C. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
  - 1. Provide galvanized finish for exterior installations and where indicated.
- D. Plates, Shapes, and Bars: ASTM A 36/A 36M.
- E. Silicon content: Limit silicone content of steel for galvanizing to less than 0.04 percent.
- F. Phosphorus content: Limit phosphorus content of steel for galvanizing to less than 0.02 percent.

**2.3 FASTENERS**

- A. General: Provide the following:

1. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Fasteners for Interconnecting Railing Components:
  1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
  2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
  3. Provide square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.
- D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
  1. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

#### 2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and containing a minimum of 95% metallic zinc and compatible with paints specified to be used over it.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
  1. Water-Resistant Product: At exterior locations and where indicated provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

## 2.5 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate and as required for galvanizing.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with welded connections unless otherwise indicated.
- H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove flux immediately.
  - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
  - 1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
- J. Form changes in direction as follows:
  - 1. As detailed.
- K. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- L. Close exposed ends of railing members with prefabricated end fittings.
- M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

- N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
  - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.
- O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- P. For railing posts set in concrete, provide steel sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with metal plate forming bottom closure.
- Q. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.
- R. Handrail Diameter: Provide handrail pipe with 1 ¼ inch O.D.

## 2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

## 2.7 STEEL AND IRON FINISHES

- A. Galvanized Railings:
  - 1. Hot-dip galvanize all exterior and indicated steel and iron railings, including hardware, after fabrication.
  - 2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
  - 3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
  - 4. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
  - 5. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

- B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.
- C. Preparing Galvanized Railings for Powder Coating: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.
- D. Shop-Applied Powder Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than 1.5 mils (0.04 mm). Prepare, treat, and coat metal to comply with resin manufacturer's written instructions.
  - 1. Color: Match existing metal guardrails.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

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

#### 3.2 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
  - 1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
  - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
  - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).
- C. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

#### 3.3 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches (50 mm) beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches (150 mm) of post.

### 3.4 ANCHORING POSTS

- A. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Leave anchorage joint exposed with 1/8-inch (3-mm) buildup, sloped away from post.
- C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
  1. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

### 3.5 ATTACHING RAILINGS

- A. Attach railings to wall with wall brackets, except where end flanges are used. Provide brackets with 1-1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
  1. Use type of bracket with predrilled hole for exposed bolt anchorage.
  2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- B. Secure wall brackets and railing end flanges to building construction as follows:
  1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
  2. For hollow masonry anchorage, use toggle bolts.
  3. For wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate with carpentry work to locate backing members.

### 3.6 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

1. Apply by brush or spray an organic zinc-rich coating containing 95% metallic zinc, by weight in the dried film; provide a minimum 3.0-mil (0.05-mm) dry film thickness.
2. Fill galvanizing drain holes with zinc plugs and file smooth.

### 3.7 PROTECTION

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

END OF SECTION 05 52 13

**SECTION 06 10 00 - ROUGH CARPENTRY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Framing with dimension lumber.
2. Framing with timber.
3. Framing with engineered wood products.
4. Framing connectors
5. Wood blocking, cants, and nailers.
6. Plywood backing panels.
7. Pressure treating

- B. Related Requirements:

1. Division 06, Section "Sheathing" for coordination with framing requirements.

**1.3 DEFINITIONS**

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- C. Timber: Lumber of 5 inches nominal (114 mm actual) or greater in least dimension.
- D. Lumber grading agencies, and the abbreviations used to reference them, include the following:
  1. NLGA: National Lumber Grades Authority.
  2. WCLIB: West Coast Lumber Inspection Bureau.
  3. WWPA: Western Wood Products Association.

**1.4 SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product.
  1. Lumber: Grade and Species, Moisture Content
  2. Engineered Wood Products:

- a. Indicate component materials and dimensions and include construction and application details.
3. Wood Preservative Treated Lumber:
  - a. Lumber: Grade and Species.
  - b. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  - c. For exposed wood preservative treated lumber indicate conformance with 2.2,A,2 and 2.4,C,1.
  - d. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
  - e. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
4. Fasteners
5. Framing Anchors and Connectors
6. Hold Downs/Ties
7. Sill Sealer Gasket
8. Water Repellant Preservative

## 1.5 DELIVERY, STORAGE, AND HANDLING

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

## PART 2 - PRODUCTS

### 2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
  3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  4. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less, 19 percent for more than 2-inch nominal (38-mm actual) thickness

- C. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- D. Exposed Framing:
1. Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance including:
    - a. Decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.
    - b. Rough surfaces
  2. Application: Exposed exterior and interior framing. Treated or untreated.
  3. Species and Grade: as indicated on Drawings.
  4. Additional Restriction: Free of heart centers.
  5. Surfacing: All exposed framing, treated or untreated, shall be smooth planed unless otherwise noted.

## 2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process:
1. AWPA U1
    - a. Use Category UC2 for interior construction not in contact with the ground
    - b. Use Category UC3b for exterior construction not in contact with the ground.
    - c. Use Category UC4a for items in contact with the ground.
  2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Use inorganic boron (SBX) for sill plates.
  3. For exposed items indicated to receive a painted, stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.
- C. Application: Treat items indicated on Drawings, and the following:
1. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

2. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
3. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
4. Wood floor plates that are installed over concrete slabs-on-grade.
5. Exterior wood framing exposed to the weather.

## 2.3 DIMENSION LUMBER FRAMING

### A. Lumber Species:

1. Framing Lumber: Douglas Fir, WCLIB or WWPA
2. Unexposed Treat Wood: Douglas Fir, WCLIB or WWPA.
3. Exposed Treated Wood (indicated to receive painted, stained or natural finish): Coastal Douglas Fir, WCLIB or WWPA. Do not incise.

### B. Lumber Grade: See notes on Structural Drawings.

## 2.4 ENGINEERED WOOD PRODUCTS

- A. Engineered Wood Products, General: Products shall contain no urea formaldehyde.
- B. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.
- C. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. RedBuilt LLC.
    - b. Louisiana-Pacific Corporation.
    - c. Weyerhaeuser Company.
- D. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. RedBuilt LLC.
    - b. Louisiana-Pacific Corporation.
    - c. Weyerhaeuser Company.
- E. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges.

Provide units complying with material requirements of and with structural capacities established and monitored according to ASTM D 5055.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. TrusJoist MacMillan
    - b. Louisiana-Pacific Corporation.
    - c. Weyerhaeuser Company.
  2. Web Material: Either oriented strand board or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
  3. Structural Properties: Provide units with depths and design values not less than those indicated.
  4. Provide units complying with APA PRI-400, factory marked with APA trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA standard.
- F. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research/evaluation report for I-joists.
1. Manufacturer: Provide products by same manufacturer as I-joists.
  2. Material: All-veneer product or product made from any combination solid lumber, wood strands, and veneers.
  3. Thickness: as noted on Drawings.
  4. Provide performance-rated product complying with APA PRR-401, rim board grade, factory marked with APA trademark indicating thickness, grade, and compliance with APA standard.

## 2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  1. Blocking.
  2. Nailers.
- B. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

## 2.6 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, Exterior, AC, fire-retardant treated when required by code, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

1. Plywood shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M, unless otherwise noted.
  2. Provide stainless steel fasteners at rainscreen furring, siding and trim.
  3. Provide stainless steel fasteners with stainless steel framing anchors.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
  1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
  2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

## 2.8 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Simpson Strong-Tie Co., Inc.
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis

and demonstrated by comprehensive testing performed by a qualified independent testing agency.

- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.
  - 1. Use for interior locations unless otherwise indicated.
- D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
  - 1. Use for exterior locations and for wood-preservative-treated lumber when approved by framing anchor manufacturer as compatible with treatment type and treatment retention amount.
- E. Stainless-Steel Sheet: ASTM A 666, Type 304.
  - 1. Use for wood-preservative-treated lumber when recommended by framing anchor manufacturer for treatment type and retention amount.
- F. Joist Hangers: As noted on Drawings.
- G. Post Bases: As noted on Drawings.
- H. Joist Ties / Rafter Ties: as indicated on Drawings
- I. Floor-to-Floor Ties: as indicated on Drawings.
- J. Hold-Downs: as indicated on Drawings.

## 2.9 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: 3/8 inch polyurethane foam membrane with intergal self adhered membrane, selected from manufacturer's standard widths to suit width of sill members indicated.
  - 1. Products:
    - a. Protecto Wrap; Protecto Premium Energy Sill Sealer.
    - b. Primer: Manufactureres' approved.
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.040 inch (0.6 mm).
  - 1. Products: Fortifiber; Fortiflash 40.
- C. Mechanically Attached Membrane Flashing: Multi-layer composite employing polyolefin and fiberglass reinforced membrane.
  - 1. Products: Fortifiber Building Systems Group; Moistop PF flashing.

- D. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
  - 1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- E. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. Coordination with other components. Coordinate location of framing members with exterior joints in finish paneling. Coordinate framing with mechanical penetrations. Coordinate framing and blocking with items to be attached to framing.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- D. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- E. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
- F. Shear Wall Panels: Install shear wall panels to comply with manufacturer's written instructions or as indicated on Drawings.
- G. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- H. Do not splice structural members between supports unless otherwise indicated.
- I. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

- J. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
  2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- (38-mm actual-) thickness.
  3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. (9.3 sq. m) and to solidly fill space below partitions.
  4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.
- K. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- L. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
1. Use inorganic boron for items that are continuously protected from liquid water.
  2. Use copper naphthenate for items not continuously protected from liquid water.
- M. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. NES NER-272 for power-driven fasteners.
  2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
  3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
- N. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- O. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
1. Comply with indicated fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.
  2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
  3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

### 3.2 AIR BARRIER COORDINATION

- A. Sill: Install sill sealer gasket to form continuous seal between sill plates and foundation walls per manufacturer's instructions. Prime substrate per manufacturer's instructions.

### 3.3 WOOD BLOCKING, AND NAILER INSTALLATION

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

### 3.4 WOOD FURRING INSTALLATION

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- (19-by-38-mm actual-) size furring vertically at 16 inches (406 mm) o.c.

### 3.5 WALL AND PARTITION FRAMING INSTALLATION

- A. General: Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions and for load-bearing partitions where framing members bearing on partition are located directly over studs. Fasten plates to supporting construction unless otherwise indicated.
  1. For exterior wall: as indicated on Drawings.
  2. For interior partitions and walls: as indicated on Drawings.
  3. Provide continuous horizontal blocking at midheight of partitions more than 96 inches (2438 mm) high, using members of 2-inch nominal (38-mm actual) thickness and of same width as wall or partitions.
  4. Use 'Intermediate Framing' techniques as indicated on Drawings.
- B. Construct corners and intersections with three studs, except that two studs may be used for interior non-load-bearing partitions.
- C. Provide blocking at exterior corners to provide nailbase for siding, trim and rainscreen furring.
- D. Frame openings as indicated on drawings. Minimize the use of additional jamb studs and cripples by using metal framing header hangers. Provide header members of thickness equal to width of studs.

### 3.6 FLOOR JOIST FRAMING INSTALLATION

- A. General: Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches (38 mm) of bearing on wood or metal, or 3 inches (76 mm) on masonry. Attach floor joists as follows:
  - 1. Where supported on wood members, by using metal framing anchors.
  - 2. Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.
- B. Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches (1200 mm).
- C. Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than 1/3 depth of joist; do not locate closer than 2 inches (50 mm) from top or bottom.
- D. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist at ends of joists unless nailed to header or band.
- E. Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches (102 mm) or securely tie opposing members together. Provide solid blocking of 2-inch nominal (38-mm actual) thickness by depth of joist over supports.
- F. Provide solid blocking between joists under jamb studs for openings.
- G. Under non-load-bearing partitions, provide double joists separated by solid blocking equal to depth of studs above.
  - 1. Provide triple joists separated as above, under partitions receiving ceramic tile and similar heavy finishes or fixtures.

### 3.7 RAFTER FRAMING INSTALLATION

- A. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

### 3.8 TIMBER FRAMING INSTALLATION

- A. Install timber with crown edge up and provide not less than 4 inches (102 mm) of bearing on supports. Provide continuous members unless otherwise indicated; tie together over supports as indicated if not continuous.
- B. Install wood posts using metal anchors indicated.
- C. Treat ends of timber beams and posts exposed to weather by dipping in water-repellent preservative for 15 minutes.

**3.9 STAIR FRAMING INSTALLATION**

- A. Provide stair framing members of size, space, and configuration indicated.
  - 1. Exterior Stairs:
    - a. Size: as noted on Drawings.
    - b. Material: as indicated on Drawings, Pressure Treated.
    - c. Notching: Do not notch.
- B. Provide stair framing with no more than 3/16-inch (4.7-mm) variation between adjacent treads and risers and no more than 3/8-inch (9.5-mm) variation between largest and smallest treads and risers within each flight.

**3.10 PROTECTION**

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

END OF SECTION 06 10 00

**SECTION 06 16 00 - SHEATHING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Wall sheathing.
2. Roof sheathing.
3. Subflooring

- B. Related Requirements:

1. Division 06, Section "Rough Carpentry" for framing to be coordinated with sheathing.
2. Division 07, Section "Weather Barriers" for water-resistive barrier applied over wall sheathing.

**1.3 SUBMITTALS**

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

1. Sheathing, Wall, Eave, Roof and Floor: Grade and Type

**1.4 DELIVERY, STORAGE, AND HANDLING**

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

**PART 2 - PRODUCTS****2.1 WOOD PANEL PRODUCTS**

- A. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.
- B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- C. Factory mark panels to indicate compliance with applicable standard.

## 2.2 WALL SHEATHING

- A. Plywood Wall Sheathing: Exterior, Structural I sheathing.
  - 1. Span Rating: Not less than 24/0.
  - 2. Nominal Thickness: as indicated on Drawings, verify match with existing.
- B. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.
  - 1. Products: Subject to compliance with requirements, provide the following:
    - a. CertainTeed Corporation; GlasRoc.
    - b. G-P Gypsum Corporation; Dens-Glass Gold.
    - c. United States Gypsum Co.; Securock.
  - 2. Type and Thickness: Type X, 5/8 inch (15.9 mm) thick.
  - 3. Size: 48 by 96 inches (1219 by 2438 mm) for vertical installation.

## 2.3 ROOF SHEATHING

- A. Plywood Roof Sheathing: Exterior, Structural I sheathing.
  - 1. Span Rating: Not less than 24/0.
  - 2. Nominal Thickness: As indicated on Drawings verify match with existing.
- B. Plywood Rake and Eave Sheathing: Exterior, Structural I sheathing A/C.
  - 1. Span Rating: Not less than 24/0.
  - 2. Nominal Thickness: As indicated on Drawings verify match with existing.

## 2.4 SUBFLOORING AND UNDERLayment

- A. Oriented-Strand-Board Subfloor: Exposure 1 single-floor panels.
  - 1. Span Rating: Not less than 24/16.
  - 2. Nominal Thickness: As indicated on Drawings, verify match with existing.
  - 3. Edge Detail: Tongue and groove.
- B. Plywood Underlayment for Resilient Flooring: DOC PS 1, Exterior, A-C Plugged, with fully sanded face, not less than 3/8-inch (9.5-mm) nominal thickness.

## 2.5 FASTENERS

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

1. Where sheathing is exposed to weather, or in area of high relative humidity provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.

## 2.6 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.
  1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
  1. NES NER-272 for power-driven fasteners.
  2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
  3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's "International Residential Code for One- and Two-Family Dwellings."
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

### 3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Install fasteners as indicated on Drawings.
- C. Install 'Eave Sheathing' at overhangs, rakes and eaves when underside of eaves are exposed to view.
- D. Fastening Methods: Fasten panels as indicated below:
  1. Subflooring:
    - a. Glue and nail to wood framing.
    - b. Space panels 1/8 inch (3 mm) apart at edges and ends.
  2. Wall and Roof Sheathing:
    - a. Nail to wood framing.
    - b. Space panels 1/8 inch (3 mm) apart at edges and ends.
  3. Underlayment:
    - a. Nail to subflooring.
    - b. Space panels 1/32 inch (0.8 mm) apart at edges and ends.
    - c. Fill and sand edge joints of underlayment receiving resilient flooring immediately before installing flooring.

### 3.3 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
  1. Fasten gypsum sheathing to wood framing with nails or screws.
  2. Install boards with a 3/8-inch (9.5-mm) gap where non-load-bearing construction abuts structural elements.
  3. Install boards with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.

1. Space fasteners as noted on Drawings and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.

END OF SECTION 06 16 00

**SECTION 06 20 13 - EXTERIOR FINISH CARPENTRY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:
  - 1. Exterior railings.
- B. Related Requirements:
  - 1. Division 06, Section "Rough Carpentry" for framing coordination.

**1.3 SUBMITTALS**

- A. Compliance Certificates:
  - 1. For lumber that is not marked with grade stamp.

**1.4 DELIVERY, STORAGE, AND HANDLING**

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

**1.5 FIELD CONDITIONS**

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

**PART 2 - PRODUCTS****2.1 MATERIALS, GENERAL**

- A. Lumber: DOC PS 20 and the following grading rules:
  - 1. NeLMA: Northeastern Lumber Manufacturers' Association, "Standard Grading Rules for Northeastern Lumber."
  - 2. NLGA: National Lumber Grades Authority, "Standard Grading Rules for Canadian Lumber."
  - 3. WCLIB: West Coast Lumber Inspection Bureau, Standard No. 17, "Grading Rules for West Coast Lumber."
  - 4. WWPA: Western Wood Products Association, "Western Lumber Grading Rules."
- B. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.
  - 1. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by inspection agency.

**2.2 EXTERIOR GUARDRAILS AND RAILINGS**

- A. Lumber Trim
  - 1. Species and Grade: Western red cedar, Tight Knot; NLGA, WCLIB, or WWPA.
  - 2. Maximum Moisture Content: 15 percent with at least 85 percent of shipment at 12 percent or less.
  - 3. Finger Jointing: Not allowed.
  - 4. Face Surface: Surfaced (smooth four sides).

**2.3 MISCELLANEOUS MATERIALS**

- A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.
  - 1. For face-fastening exterior finish carpentry, provide stainless steel ringed-shank siding nails.
- B. Flashing: Comply with requirements in Division 07, Section "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.

**2.4 FABRICATION**

- A. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Prime lumber to be painted, including both faces and edges, unless factory primed. Cut to required lengths and prime ends. Comply with requirements in Section 09 91 13 "Painting."

### 3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.
  1. Do not use manufactured units with defective surfaces, sizes, or patterns.
- B. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
  1. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
  2. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
  3. Install stairs with no more than 3/16-inch (4.7-mm) variation between adjacent treads and risers and with no more than 3/8-inch (9.5-mm) variation between largest and smallest treads and risers within each flight.
  4. Coordinate exterior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

### 3.4 WOOD RAILING INSTALLATION

- A. Install wood railings as indicated in Drawings.
  1. Use continuous pieces for all top and bottom rails and caps.
  2. Space guardrail and handrail components so that no opening exceeds 4 inches in width.
  3. Fasten railing components with stainless steel connectors and fasteners.
  4. Fasten posts and other bolted connections with hot-dipped galvanized fasteners.

**3.5 ADJUSTING**

- A. Replace exterior finish carpentry that is damaged or does not comply with requirements. Exterior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

**3.6 CLEANING**

- A. Clean exterior finish carpentry on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

**3.7 PROTECTION**

- A. Protect installed products from damage from weather and other causes during construction.
- B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.
  1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 06 20 13

**SECTION 06 20 23 - INTERIOR FINISH CARPENTRY****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

- 1. Interior trim.

- B. Related Requirements:

- 1. Division 06, Section "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view and for framing exposed to view.
  - 2. Division 06, Section "Interior Architectural Woodwork" for fabricated interior jambs and frames, wire closet shelving, plastic laminate counter tops.
  - 3. Division 09, Section "Painting" for priming and backpriming of interior finish carpentry.

**1.3 DEFINITIONS**

- A. MDF: Medium-density fiberboard.
- B. MDO: Plywood with a medium-density overlay on the face.

**1.4 SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.
- B. Samples:
  - 1. For each finish system and color of lumber and panel products with factory-applied finish, 12 inches long.

**1.5 DELIVERY, STORAGE, AND HANDLING**

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

- B. Deliver interior finish carpentry materials only when environmental conditions meet requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

## 1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.
1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Low-Emitting Materials: Composite wood products shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Lumber: DOC PS 20 and the following grading rules:
1. NeLMA: Northeastern Lumber Manufacturers' Association, "Standard Grading Rules for Northeastern Lumber."
  2. NHLA: National Hardwood Lumber Association, "Rules for the Measurement and Inspection of Hardwood & Cypress."
  3. NLGA: National Lumber Grades Authority, "Standard Grading Rules for Canadian Lumber."
  4. SPIB: The Southern Pine Inspection Bureau, "Standard Grading Rules for Southern Pine Lumber."
  5. WCLIB: West Coast Lumber Inspection Bureau, Standard No. 17, "Grading Rules for West Coast Lumber."
  6. WWPA: Western Wood Products Association, "Western Lumber Grading Rules."
- C. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.
1. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by inspection agency.

- D. MDF: ANSI A208.2, Grade 130, made with binder containing no urea-formaldehyde resin.
- E. MDF-Moisture Resistant: ANSI A208.2, Grade 155 and ASTM D1037-96A made with binder containing no urea-formaldehyde resin. 5% maximum water absorption.

## 2.2 INTERIOR TRIM

- A. MDF trim for Painted Finish (pre-primed)
  - 1. SPERO, 100% recycled wood fiber (SCS certified) trim and moulding.
  - 2. Urea-formaldehyde content: 0%
  - 3. Surfaces; Smooth machined profiles and edges.
  - 4. Profiles:
    - a. Door Trim: Match existing profile.
    - b. Base: Match existing profile.
    - c. Window Skirt: 3/8 x 2 1/4 inch square base or match existing profile.
- B. Moisture Resistant MDF
  - 1. Urea-formaldehyde content: 0%
  - 2. Surfaces; Smooth machined profiles and edges.
  - 3. Profiles:
    - a. Window Sill: 1 inch x as required.

## 2.3 MISCELLANEOUS MATERIALS

- A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.
  - 1. Use finish nails for exposed attachment of trim. Set nails prior to finishing.
  - 2. Exposed Screws: for removable sections of work, round headed phillips screw, chromium plated with dished washers to match.
- B. Low-Emitting Materials: Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.
  - 1. Wood glue shall have a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## 2.4 FABRICATION

- A. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

### 3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, too small to fabricate with proper jointing arrangements, or with defective surfaces, sizes, or patterns.
- B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
  1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
  2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
  3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining interior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
  4. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

### 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. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope or Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.

1. Install trim after gypsum-board joint finishing operations are completed.
2. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

### 3.5 ADJUSTING

- A. Replace interior finish carpentry that is damaged or does not comply with requirements. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

### 3.6 CLEANING

- A. Clean interior finish carpentry on exposed and semiexposed surfaces. Restore damaged or soiled areas and touch up factory-applied finishes, if any.

### 3.7 PROTECTION

- A. Protect installed products from damage from weather and other causes during construction.
- B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.
  1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 06 20 23

**SECTION 06 40 23 - INTERIOR ARCHITECTURAL WOODWORK****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes but is not limited to the following:

1. Interior frames and jambs.
2. Wood cabinets.
3. Plastic-laminate countertops.
4. Closet shelving (fabricated wire system)
5. Shop finishing of interior woodwork.
6. Plastic Laminate Wall Protection

- B. Related Sections include the following:

1. Division 06, Section "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.
2. Division 06, Section "Interior Finish Carpentry" for interior carpentry exposed to view what is not specified in this Section.

**1.3 DEFINITIONS**

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

**1.4 SUBMITTALS**

- A. Product Data: For each type of product indicated, including panel products, cabinet hardware and accessories handrail brackets and finishing materials and processes.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
1. Show details full size.
  2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.

3. Show locations and sizes of cutouts and holes for plumbing fixtures faucets soap dispensers and other items installed in architectural woodwork.
  4. Apply compliance label to first page of Shop Drawings.
- C. Samples:
1. Lumber with or for transparent finish, not less than 50 sq. in. (300 sq. cm), for each species and cut, finished.
  2. Plastic laminates: for each type, color, pattern, and surface finish.
  3. Exposed cabinet hardware and accessories, one unit for each type and finish.
- D. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates or WI-certified compliance certificates.

## 1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program. Shop is a licensee of WI's Certified Compliance Program.
- B. Installer Qualifications: Fabricator of products.
- C. Quality Standard: Unless otherwise indicated, comply with AWI's or WI's standards for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.

2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

## 1.8 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.
- B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)" to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Provide materials that comply with requirements of AWI's or WI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Species and Cut for Transparent Finish: See individual items below.
- C. Wood Species for Opaque Finish: See items below.
- D. Wood Products: Comply with the following:
  1. Recycled Content of Medium-Density Fiberboard and Particleboard: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 100% percent.
  2. Low-Emitting Materials: Composite wood products shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
  3. Hardboard: AHA A135.4.
  4. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
  5. Particleboard: ANSI A208.1, Grade M-2, made with binder containing no urea formaldehyde.
  6. Particleboard: Straw-based particleboard complying with requirements in ANSI A208.1, Grade M-2, except for density.
  7. Softwood Plywood: DOC PS 1, Medium Density Overlay.
  8. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.

- E. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
  - 1. Provide PVC or polyester edge banding complying with LMA EDG-1 on components with exposed or semiexposed edges.
- F. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.
  - 1. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
    - a. Formica Corporation.
    - b. Nevamar Company, LLC; Decorative Products Div.
    - c. Wilsonart International; Div. of Premark International, Inc.

## 2.2 CLOSET AND STORAGE SHELF SYSTEM

- A. Shelving: Vinyl coated, steel rod, ventilated shelving and storage system.
  - 1. Closet Maid
  - 2. Rubbermaid
  - 3. Organized Living
- B. Standards and Brackets: Manufacturer's fixed, wall mounted system.

## 2.3 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)."
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening, self-closing.
- C. Wire Pulls: Back mounted, solid metal, 4 inches (100 mm) long, 5/16 inch (8 mm) in diameter.
- D. Catches: Magnetic catches, BHMA A156.9, B03141.
- E. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.
- F. Drawer Slides: BHMA A156.9, B05091.
  - 1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated steel ball-bearing slides.
- G. Grommets for Cable Passage through Countertops: 2-inch (51-mm) OD, brown, molded-plastic grommets and matching plastic caps with slot for wire passage.
- H. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
- I. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

## 2.4 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.
- C. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.
- D. Handrail Brackets: Cast from malleable iron with wall flange drilled for exposed anchor and with support arm for screwing to underside of rail. Sized to provide 1-1/2-inch (38-mm) clearance between handrail and wall.
- E. Adhesives, General: Adhesives shall not contain urea formaldehyde.
- F. Low-Emitting Materials: Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- G. VOC Limits for Installation Adhesives: Installation adhesives shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  1. Wood Glues: 30 g/L.
  2. Multipurpose Construction Adhesives: 70 g/L.
  3. Contact Adhesive: 250 g/L.
- H. Adhesive for Bonding Plastic Laminate: Contact cement.
  1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.
- I. Countertop Braces: "Speed Brace" by Fastcap; 888-443-3748. Size as required by item being mounted.

## 2.5 FABRICATION, GENERAL

- A. Interior Woodwork Grade: Unless otherwise indicated, provide Premium-grade interior woodwork complying with referenced quality standard.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
  - 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch (19 mm) Thick or Less: 1/16 inch (1.5 mm).
  - 2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).
  - 3. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch (1.5 mm).
- D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
  - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
  - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- E. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
  - 1. Seal edges of openings in countertops with a coat of varnish.

## 2.6 INTERIOR FRAMES AND JAMBS FOR OPAQUE FINISH

- A. Grade: Premium.
- B. Wood Species: Eastern white pine, sugar pine, or western white pine.

## 2.7 PLASTIC-LAMINATE COUNTERTOPS

- A. Grade: Premium.
- B. High-Pressure Decorative Laminate Grade: HGS.
- C. Colors, Patterns, and Finishes: As selected by Architect.
- D. Edge Treatment: Same as laminate cladding on horizontal surfaces Lumber edge for transparent finish matching wood species and cut on cabinet surfaces or as indicated.
- E. Core Material: Particleboard made with exterior glue, one inch thick.

## 2.8 SHOP FINISHING

- A. Grade: Provide finishes of same grades as items to be finished.
- B. General: Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- C. Finishing Materials: Products shall comply with the testing and product requirements of the California Department of Health Services "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Shop Priming: Shop apply the prime coat including backpriming, if any, for transparent-finished items specified to be field finished.
- E. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
  - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.
- F. Opaque Finish:
  - 1. Grade: Premium.
  - 2. Finish: Factory Primed, field applied finish coats per Section 09 91 23 "Painting"

## PART 3 - EXECUTION

### 3.1 PREPARATION

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

### 3.2 INSTALLATION

- A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.

- C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.
- F. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- G. Paneling: Anchor paneling to supporting substrate with concealed panel-hanger clips. Do not use face fastening, unless covered by trim or otherwise indicated.
  - 1. Install flush paneling with no more than 1/16 inch in 96-inch (1.5 mm in 2400-mm) vertical cup or bow and 1/8 inch in 96-inch (3 mm in 2400-mm) horizontal variation from a true plane.
- H. Plastic Laminate Wall Protection: Set plastic laminate with contact adhesive. Apply adhesive to full surface of both wall and back of plastic laminate panel. Apply edge trim to all exposed edges as shown on Drawings. .
- I. Wire Shelving System:
  - 1. Attach shelving system to wall using screws set into solid blocking or studs. Do not screw to un-backed gypsum board.
  - 2. Install wire shelving system according to manufacturer's installation instructions.
  - 3. Provide the following configurations. Designations are based on Closet Maid system.
    - a. Bedroom and Unit Entry Closets: "Shelf and Rod Shelving"; 12 inch deep. Provide 1 full length shelf per closet.
    - b. Storage Closets: "Linen Shelving"; 12, 16, and 20 inch deep, per Drawings. Provide 5 full-length shelves per closet.
- J. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
  - 1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
  - 2. Maintain veneer sequence matching of cabinets with transparent finish.
  - 3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for 1-inch (25-mm) penetration into wood framing, blocking, or hanging strips.
- K. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
  2. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
  3. Secure backsplashes to tops with concealed metal brackets at 16 inches (400 mm) o.c. and to walls with adhesive.
  4. Caulk space between backsplash and wall with sealant specified in Section 07 92 00 "Joint Sealants."
- L. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
- M. Wood Frames:
1. Grade: Install wood frames to comply with same grade as item to be installed.
  2. Assemble wood frames and complete fabrication at Project site to the extent that it was not completed in the shop.
  3. Install wood frames level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
  4. Scribe and cut wood frames to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
  5. Anchor wood frames to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
    - a. For shop-finished items, use filler matching finish of items being installed.
  6. Touch up finishing work specified in this Section after installation of wood frames. Fill nail holes with matching filler where exposed.
  7. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop
- N. Refer to Division 09, Section "Painting" for final finishing of installed architectural woodwork not indicated to be shop finished.

### 3.3 ADJUSTING AND CLEANING

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

END OF SECTION 06 40 23

**SECTION 071416 - COLD FLUID-APPLIED WATERPROOFING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

- 1. Polyurethane waterproofing.

- B. Related Requirements:

- 1. Division 01, Section "Delegated Design and Deferred Submittals" for administrative requirements for responsibilities of the Contractor.
  - 2. Division 03, Section "Cast in Place Concrete" for existing concrete substrates to be prepared to receive below grade waterproofing.
  - 3. Division 07, Section "Traffic Coatings" for below grade waterproofing to be coordinated with traffic coatings.

**1.3 PREINSTALLATION MEETINGS**

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

- 1. Review waterproofing requirements including, but not limited to, the following:
    - a. Surface preparation specified in other Sections.
    - b. Minimum curing period.
    - c. Forecasted weather conditions.
    - d. Special details and sheet flashings.
    - e. Repairs.

**1.4 SUBMITTALS**

- A. Product Data: For each type of product, including but not limited to:

- 1. Waterproofing system
    - a. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
    - b. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

2. Protection course
  3. Drainage panels
- B. Shop Drawings:
1. Show locations and extent of waterproofing.
  2. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
- C. Delegated Design: Design waterproofing transitions as indicated on Drawings. Transitions include, but may not be limited to below-grade, to and from traffic coatings, and terminations.
- D. Qualification Data: For Installer.
- E. Sample Warranties: For special warranties.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.
1. Build mockup for each typical waterproofing installation including accessories to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.
    - a. Size: 100 sq. ft. (9.3 sq. m) in area.
    - b. Description: Each type of wall installation.
  2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.6 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer.
1. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F (3 deg C) above dew point.
  2. Do not apply waterproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.
- B. Maintain adequate ventilation during application and curing of waterproofing materials.

### 1.7 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace waterproofing that fails in materials or workmanship within specified warranty period.
  - 1. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials from single source from single manufacturer.

### 2.2 SINGLE-COMPONENT POLYURETHANE WATERPROOFING

- A. Single-Component, Modified Polyurethane Waterproofing: ASTM C 836/C 836M and coal-tar free.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Tremco Incorporated; Tremproof 250 GC.

### 2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials recommended in writing by waterproofing manufacturer for intended use and compatible with one another and with waterproofing.
  - 1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Manufacturer's standard primer, sealer, or surface conditioner; factory-formulated acrylic latex, polyurethane, or epoxy.
- C. Membrane-Reinforcing Fabric: Manufacturer's recommended fiberglass mesh or polyester fabric, manufacturer's standard weight.
- D. Joint Reinforcing Strip: Manufacturer's recommended fiberglass mesh or polyester fabric.
- E. Joint Sealant: Multicomponent polyurethane sealant, compatible with waterproofing; ASTM C 920, Type M, Class 25 or greater; Grade NS for sloping and vertical applications and Grade P for deck applications; Use NT exposure; and as recommended by manufacturer for substrate and joint conditions.
  - 1. Backer Rod: Closed-cell polyethylene foam.

## 2.4 PROTECTION LAYER

- A. As recommended in writing by the waterproofing manufacturer.

## 2.5 MOLDED-SHEET DRAINAGE PANELS

- A. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Composite subsurface drainage panel consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 (0.21-mm) sieve laminated to one side of the core and a polymeric film bonded to the other side; and with a vertical flow rate of 9 to 18 gpm per ft. (112 to 220 L/min. per m).

1. Products: Subject to compliance with requirements, provide one of the following:

- a. Tremco, Inc; TREMDrain 1000 or TREMDrain PF.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
  - 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
  - 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Existing Concrete: Existing concrete surface must be completely clean and clear of all existing damproofing. Contractor to use method approved by local authorities having jurisdiction and waterproofing manufacturer.
- C. Prepare concrete surfaces to Concrete Surface Profile (CSP)-5.
- D. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- E. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, acid residues, and other penetrating contaminants or film-forming coatings from concrete.

- F. Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, holes, and other voids.

### 3.3 PREPARATION AT TERMINATIONS, PENETRATIONS, AND CORNERS

- A. Prepare surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, sleeves, and corners according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M and ASTM C 1471.
- B. Apply waterproofing in two separate applications, and embed a joint reinforcing strip in the first preparation coat when recommended by waterproofing manufacturer.

### 3.4 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrate according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M and ASTM C 1471. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.
  - 1. Comply with ASTM C 1193 for joint-sealant installation.
  - 2. Apply bond breaker on sealant surface, beneath preparation strip.
  - 3. Prime substrate along each side of joint and apply a single thickness of preparation strip at least 6 inches (150 mm) wide along each side of joint. Apply waterproofing in two separate applications and embed a joint reinforcing strip in the first preparation coat.

### 3.5 WATERPROOFING APPLICATION

- A. Apply waterproofing according to manufacturer's written instructions and to recommendations in ASTM C 898/C 898M and ASTM C 1471.
- B. Start installing waterproofing in presence of manufacturer's technical representative.
- C. Apply primer over prepared substrate unless otherwise instructed in writing by waterproofing manufacturer.
- D. Unreinforced Waterproofing Applications: Mix materials and apply waterproofing by spray, roller, notched squeegee, trowel, or other application method suitable to slope of substrate.
  - 1. Apply one or more coats of waterproofing to obtain a seamless membrane free of entrapped gases and pinholes, with a minimum dry film thickness of 60 mils (1.5 mm) or manufacturers minimum recommended thickness.
  - 2. Apply waterproofing to prepared wall terminations and vertical surfaces.
  - 3. Verify manufacturer's recommended wet film thickness of waterproofing every 100 sq. ft. (9.3 sq. m).
- E. Cure waterproofing, taking care to prevent contamination and damage during application and curing.

- F. Install protection course with butted joints over waterproofing before starting subsequent construction operations.
1. For horizontal applications, install protection course loose laid over fully cured membrane.
  2. For vertical applications, set protection course in nominally cured membrane, which will act as an adhesive. If membrane cures before application of protection course, use adhesive.
  3. Molded-sheet drainage panels may be used in place of a separate protection course for vertical applications when approved in writing by waterproofing manufacturer.

### 3.6 MOLDED-SHEET DRAINAGE PANEL INSTALLATION

- A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesive or another method that does not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.
  1. For vertical applications, install protection course before installing drainage panels.
- B. Connect to piped subdrainage system specified in Section 33 46 00 "Subdrainage" per Drawings.
- C. Manufacturer's Field Service: Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components and to furnish daily reports to Architect.
- D. If test results or inspections show waterproofing does not comply with requirements, remove and replace or repair the waterproofing as recommended in writing by manufacturer, and make further repairs after retesting and inspecting until waterproofing installation passes.
- E. Prepare test and inspection reports.

### 3.7 PROTECTION

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Protect installed components from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- D. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 07 14 16

**SECTION 07 18 00 - TRAFFIC COATINGS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes traffic coatings for the following applications:

- 1. Pedestrian traffic.

- B. Related Requirements:

- 1. Division 01, Section "Delegated Design and Deferred Submittals" for administrative requirements for responsibilities of the Contractor.
  - 2. Division 03, Section "Cast in Place Concrete" for existing concrete substrates to be prepared to receive traffic coatings.
  - 3. Division 06, Section "Sheathing" for plywood substrates to receive traffic coatings.
  - 4. Division 07, Section "Cold Fluid-Applied Waterproofing" for below grade waterproofing to be coordinated with traffic coatings.

**1.3 PREINSTALLATION MEETINGS**

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

**1.4 SUBMITTALS**

- A. Product Data: For each type of product, including installation instructions.

- B. Shop Drawings: For traffic coatings.

- 1. Include details for treating substrate joints and cracks, flashings, deck penetrations, and other termination conditions.
  - 2. Include plans showing layout of pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

- C. Delegated Design: Design waterproofing transitions as indicated on Drawings. Transitions include, but may not be limited to below-grade, to and from cold fluid-applied waterproofing, and terminations.

- D. Samples for Initial Selection: For each type of exposed finish.

E. Samples for Verification: For each type of exposed finish, prepared on rigid backing.

1. Provide stepped Samples on backing to illustrate buildup of traffic coatings.

F. Qualification Data: For Installer.

G. Sample Warranty: For special warranty.

## 1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For traffic coatings to include in maintenance manuals.

## 1.6 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Mockups: Build mockups to set quality standards for materials and execution.

1. Build mockup for each traffic coating and substrate to receive traffic coatings.
2. Size: 200 sq. ft. (18.5 sq. m) of each substrate to demonstrate surface preparation, joint and crack treatment, thickness, texture, color, and standard of workmanship.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.7 FIELD CONDITIONS

A. Environmental Limitations: Apply traffic coatings within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply traffic coatings to damp or wet substrates, when temperatures are below 40 deg F (5 deg C), when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F (3 deg C) above dew point.

1. Do not apply traffic coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period. Apply only when frost-free conditions occur throughout the depth of substrate.

B. Do not install traffic coating until items that penetrate membrane have been installed.

## 1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace traffic coating that fails in materials or workmanship within specified warranty period.

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

- a. Adhesive or cohesive failures.
  - b. Abrasion or tearing failures.
  - c. Surface crazing or spalling.
  - d. Intrusion of water, oils, gasoline, grease, salt, deicer chemicals, or acids into deck substrate.
2. Warranty Period: Ten years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Material Compatibility: Provide primers; base-, intermediate-, and topcoat; and accessory materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Source Limitations:
  1. Obtain traffic coatings from single source from single manufacturer.
  2. Obtain primary traffic-coating materials, including primers, from traffic-coating manufacturer. Obtain accessory materials including aggregates, sheet flashings, joint sealants, and substrate repair materials of types and from sources recommended in writing by primary material manufacturer.
  3. Obtain pavement-marking paint from single source from single manufacturer.

### 2.2 TRAFFIC COATING

- A. Traffic Coating: Manufacturer's heavy duty, traffic-bearing, seamless, high-solids-content, cold liquid-applied, elastomeric, waterproofing membrane system with integral wearing surface for pedestrian traffic; according to ASTM C 957.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Tremco Incorporated; an RPM company.; Vulkem 360/NF/951NF.
- B. Primer: Liquid primer recommended for substrate and conditions by traffic-coating manufacturer.
- C. Preparatory and Base Coats: Two-part slightly thixotropic self-leveling polyurethane coating.
  1. Thicknesses: Minimum wet film thickness as recommended in writing by manufacturer for substrate and service conditions indicated.
- D. Intermediate Coat: A two-part aliphatic, low odor 99% solids polyurethane topcoat providing a chemical and UV resistant weatherproof wearing surface.
  1. Thicknesses: Minimum wet film thickness as recommended in writing by manufacturer for substrate and service conditions indicated

- A. Topcoat: A two-part aliphatic, low odor 99% solids polyurethane topcoat providing a chemical and UV resistant weatherproof wearing surface.
  - 1. Thicknesses: Minimum wet film thickness as recommended in writing by manufacturer for substrate and service conditions indicated
  - 2. Aggregate Content: As recommended in writing by traffic-coating manufacturer for substrate and service conditions indicated As required to achieve slip-resistant finish.
  - 3. Color: As selected by Architect from manufacturer's full range.
- B. Aggregate: Manufacturer's standard aggregate for each use indicated of particle sizes, shape, and minimum hardness recommended in writing by traffic-coating manufacturer.
- C. VOC Content: Traffic coating shall have a VOC content of 150 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Low-Emitting Materials: Traffic coating shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

### 2.3 ACCESSORY MATERIALS

- A. Joint Sealants: Two-part chemically curing, gun grade polyurethane sealant recommended in writing by coating manufacturer for substratae and joint conditions indicated and for compatibility with traffic coatings.
- B. Reinforcing Strip: Fiberglass mesh recommended in writing by traffic-coating manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for surface smoothness, surface moisture, and other conditions affecting performance of traffic-coating work.
- B. Verify that substrates are visibly dry and free of moisture.
  - 1. Test for moisture content by method recommended in writing by traffic-coating manufacturer.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of traffic-coating work.
- D. Proceed with installation only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.
  - 1. Begin coating application only after minimum concrete-curing and -drying period recommended in writing by traffic-coating manufacturer has passed and after substrates are dry.

2. Application of coating indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. General: Before applying traffic coatings, clean and prepare substrates according to ASTM C 1127 and manufacturer's written instructions to produce clean, dust-free, dry substrate for traffic-coating application. Remove projections, fill voids, and seal joints if any, as recommended in writing by traffic-coating manufacturer.
- B. Existing Concrete: Existing concrete surface must be completely clean and clear of all existing damproofing. Contractor to use method approved by local authorities having jurisdiction and traffic coating manufacturer.
- C. Schedule preparation work so dust and other contaminants from process do not fall on wet, newly coated surfaces.
- D. Mask adjoining surfaces not receiving traffic coatings to prevent overspray, spillage, leaking, and migration of coatings. Prevent traffic-coating materials from entering deck substrate penetrations and clogging weep holes and drains.
- E. Concrete Substrates: Mechanically abrade surface to a uniform profile acceptable to manufacturer, according to ASTM D 4259. Do not acid etch.
  1. Remove grease, oil, paints, and other penetrating contaminants from concrete.
  2. Remove concrete fins, ridges, and other projections.
  3. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion.
  4. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D 4258.

### 3.3 TERMINATIONS AND PENETRATIONS

- A. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at expansion joints, drains, and sleeves according to ASTM C 1127 and manufacturer's written instructions.
- B. Provide sealant cants at penetrations and at reinforced and nonreinforced, deck-to-wall butt joints.
- C. Terminate edges of deck-to-deck expansion joints with preparatory base-coat strip.
- D. Install sheet flashings at deck-to-wall expansion and dynamic joints, and bond to deck and wall substrates according to manufacturer's written recommendations.

### 3.4 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrates according to ASTM C 1127 and manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Comply with recommendations in ASTM C 1193 for joint-sealant installation.
- B. Apply reinforcing strip in traffic-coating system where recommended in writing by traffic-coating manufacturer.

### 3.5 TRAFFIC-COATING APPLICATION

- A. Apply traffic coating according to ASTM C 1127 and manufacturer's written instructions.
- B. Apply three of coats of specified compositions for traffic coating at locations as indicated on Drawings. Apply to total thickness of 50 mils dry.
- C. Start traffic-coating application in presence of manufacturer's technical representative.
- D. Verify that wet film thickness of each coat complies with requirements every 100 sq. ft. (9 sq. m).
- E. Uniformly broadcast aggregate on coats specified to receive aggregate. Embed aggregate according to manufacturer's written instructions. After coat dries, sweep away excess aggregate.
- F. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated; omit aggregate on vertical surfaces.
- G. Cure traffic coatings. Prevent contamination and damage during application and curing stages.

### 3.6 FIELD QUALITY CONTROL

- A. Engage a full time site representative employed by the traffic coating manufacturer to inspect substrate conditions, surface preparation, and application of the coating and to furnish daily reports to the Architect.
- B. Flood Testing: Flood test each deck area for leaks, according to recommendations in ASTM D5957, after traffic coating has completely cured. Install temporary containment assemblies, plg or dam drains and flood with potable water.
- C. Final Traffic-Coating Inspection: Arrange for traffic-coating manufacturer's technical personnel to inspect membrane installation on completion.
  1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- E. Prepare test and inspection reports.

### 3.7 PROTECTING AND CLEANING

- A. Protect traffic coatings from damage and wear during remainder of construction period.

- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 18 00

**SECTION 07 21 00 - THERMAL INSULATION****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:
  - 1. Glass-fiber blanket insulation.
  - 2. Loose-fill insulation.
  - 3. Crawlspace vapor barrier.

**1.3 SUBMITTALS**

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

**1.4 QUALITY ASSURANCE**

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Insulation Installation Standard: Grade 1 RESNET (Residential Energy Services Network)

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

**1.6 WARRANTY**

- A. Fiberglass Blanket: 1 year materials
- B. Fiberglass Loose fill: 1 year materials.

**PART 2 - PRODUCTS****2.1 GLASS-FIBER BLANKET INSULATION**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. CertainTeed Corporation.
  - 2. Johns Manville.
  - 3. Owens Corning.
  - 4. Knauf Insulation
- B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 20 percent.
- C. Kraft-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II (non-reflective faced), Class C (faced surface not rated for flame propagation); Category 1 (membrane is a vapor barrier).
- D. Eave Ventilation Troughs: Preformed, plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.
- E. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:
  - 1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
  - 2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

**2.2 FIBERGLASS LOOSE-FILL INSULATION**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. CertainTeed Corporation.
  - 2. Johns Manville.
  - 3. Owens Corning.
  - 4. Knauf Insulation
- B. Glass-Fiber Loose-Fill Insulation: ASTM C 764, Type I for pneumatic application or Type II for poured application; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
  - 1. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
  - 2. Formaldehyde free.
  - 3. Thermal Resistance per Inch: R-4.23.

## 2.3 VAPOR RETARDERS

- A. Polyethylene Vapor Retarders (Crawlspac): ASTM D 4397, 6 mils (0.15 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m); black.
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
- C. Termination Bars: Metal strips designed to attach and seal the edges of crawlspac vapor retarder securely to walls and columns.
- D. Vapor Retarder Sealant: Sealant specifically manufactured for use with polyethylene vapor barriers.

## 2.4 ACCESSORIES

- A. Crawlspac Insulation Support Wire: Spring in place, carbon steel
- B. Expanding foam: Polyurethane insulating foam.

# PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders, or that interfere with insulation attachment.

## 3.2 INSTALLATION, GENERAL

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

### 3.3 INSTALLATION OF BATT INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Foam-Plastic Board Insulation: Seal joints between units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
  1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
  2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
  3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
  4. Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
  5. For wood-framed construction, install blankets according to ASTM C 1320.
  6. Vapor-Retarder-Faced Blankets:
    - a. Exterior Walls: Set units with vapor barrier facing placed toward interior of construction.
  7. Crawlspaces: Install insulation in contact with floor sheathing above. Hold in place with support wires sprung in place at spacing recommended by manufacturer.
- D. Loose-Fill Insulation:
  1. Seal penetrations in the ceiling and wall top plates and gypsum board to wood connections with duct mastic before installing attic insulation.
  2. Apply according to ASTM C 1015 and manufacturer's written instructions. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.
  3. For cellulosic-fiber loose-fill insulation, comply with CIMA's Bulletin #2, "Standard Practice for Installing Cellulose Insulation."
- E. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
  1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
  2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

**3.4 INSTALLATION OF VAPOR RETARDERS**

- A. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- B. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.
- C. Install vapor retarder in crawlspaces, tape all joints. Secure and seal edges to walls and posts with termination bars with sealant.

**3.5 PROTECTION**

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

**3.6 INSULATION SCHEDULE**

- A. Exterior Walls: R-21HD fiberglass batt. (5.5 inch stud bays) – selective replacement.
- B. Roof: R-49 - blown-in over existing as required to achieve value.
- C. Crawl Space: R-30 batt insulation – selective replacement and addition to existing as required to achieve value.

END OF SECTION 07 21 00

**SECTION 07 25 00 - WEATHER RESISTIVE BARRIER/AIR BARRIER****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Weather resistive barrier (WRB) and air barrier (AB)
2. Flexible flashing.
3. Wall penetration flashing panels
4. Corner flashing
5. Primer
6. Weather barrier tape
7. Sealant
8. Fasteners

- B. Related Requirements:

1. Division 01, Section "Air Barrier System Coordination" for administrative requirements for responsibilities of the Contractor to accomplish an airtight building enclosure.
2. Division 06, Section "Sheathing" for joint and penetration treatment and sheathing preparation prior to installation of weather resistive barriers.
3. Division 07, Section "Traffic Coatings" for weather resistive barriers coordinated at traffic coating terminations.
4. Division 07, Section "Fiber Cement Siding and Trim" for rain screen system integral with weather resistive barrier.
5. Division 07, Section "Sheet Metal Flashing and Trim" for flashings integral with weather resistive barrier.
6. Division 07, Section "Joint Sealants" for sealants used in conjunction with weather resistive barrier.
7. Division 08, Section "Sliding Vinyl Framed Glass Doors" for door flanges, shims, and mesh underlayment integral with weather resistive barriers.
8. Division 08, Section "Vinyl Windows" for window flanges, shims, and mesh underlayment integral with weather resistive barriers.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product

- a. For weather resistive barrier / air barrier, include data on air and water-vapor permeance based on testing according to referenced standards.
- b. Installation instructions and diagrams.

B. Warranty: Sample of warranty

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain all system components from a single source from a single manufacturer.
- B. Compatibility of components: Verify compatibility of all components used in weather barrier system.
- C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
  - 1. Notify Architect and weather resistive barrier/air barrier manufacturer's representative minimum two weeks in advance of mockup.
  - 2. Mockup to be constructed as a free standing assembly to remain in place until referenced work is complete and removal is approved. Mockup will not remain as part of the finished work.
  - 3. Include the following elements in the mockups:
    - a. Exterior wall framing.
    - b. Simulated foundation condition.
    - c. Roof to exterior wall condition.
    - d. Exterior sheathing.
    - e. Weather resistive barrier/air barrier details including but not limited to: foundation to wall, roof to wall, wall to windows and doors, mechanical and plumbing penetrations, electrical penetrations including device boxes, flashings and through wall flashings.
    - f. Rain screen spacer and drainage materials.
    - g. Typical exterior window and exterior door.
    - h. Exterior siding materials including inside corners, outside corners, diverter flashings and foundation terminations.
    - i. Typical exterior mechanical wall penetrations including exhaust vents, pipes, packaged terminal heat pumps, hose bibs and louvers.
    - j. Typical exterior electrical wall penetrations including exterior lighting, meter boxes, utility boxes, conduit and wires.
    - k. Typical exterior structural wall penetrations including ledgers, beams and nailed or bolted connectors.
  - 4. Protect accepted mockups from the elements with weather-resistant membrane.
  - 5. Approval of mockups is for quality of installation, coordination with other materials, and aesthetic qualities.
  - 6. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
- D. Pre-installation Conferences: Conduct conference at Project site before and after construction of the mock-up.
- E. Manufacturer's field representative to provide on-site training of installers to ensure proper use and installation of weather barrier / air barrier materials.

## 1.5 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's project specific warranty in which weather resistive barrier / air barrier manufacturer agrees to pay the cost of materials and labor for the following:
  1. Replacement of weather resistive barrier / air barrier products that do not comply with specified performance.
  2. Correction of problems caused solely by failure of weather resistive barrier / air barrier products.
- B. Warranty Period: 10 years from purchase date of products.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Weather Resistive Barrier/Air barrier shall be capable of performing as a continuous vapor-retarding air barrier and as a liquid water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Weather barrier/air barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air Barrier Assembly Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq ft (0.2 L/s x sq/ m of surface area at 75 Pa)

### 2.2 WEATHER RESISTIVE BARRIER/AIR BARRIER

- A. Building Wrap: ASTM E 1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.
  1. Products: Subject to compliance with requirements, provide the following :
    - a. WeatherSmart, Fortifiber Building Systems Group:
      - 1) Water-Vapor Permeance: Not less than 8 perms when tested according to ASTM E 96/E 96M, Desiccant Method (Procedure A).
      - 2) Air Permeance: Not more than 0.0025 L/s/sqM at 75 pascals when tested according to ASTM E 2178.Allowable UV Exposure Time: Not less than 4 months.

- B. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.
- C. Fasteners: As recommended by manufacturer, nails or screws with 1 inch minimum diameter high density polyethylene cap.

## 2.3 FLEXIBLE FLASHING

- A. Fortifiber System
  - 1. Self-Adhering Membrane Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film.
    - a. Products: Subject to compliance with requirements, provide the following:
      - 1) Sill Flashing: Fortifiber Building Systems Group; Fortiflash 40, 40 mil overall thickness.
      - 2) Head and Jamb Flashing: Fortifiber Building Systems Group; Fortiflash 25, 25 mil overall thickness.
      - 3) Flashing at Ledgers, Beams and Nailed or Bolted Structural Connectors: Fortifiber Building Systems Group; Fortiflash 40, 40 mil overall thickness.
    - b. Lap Adhesion: Not less than 9.3 lb. per inch when tested in accordance with ASTM D-903.
    - c. Puncture Resistance: Not less than 40 lbf. when tested in accordance with ASTM E-154.
  - 2. Self-Adhering Butyl Membrane Flashing: Composite, self-adhesive, flashing product consisting of a pliable butyl compound, bonded to a high-density polyethylene film. High temperature resistance, adhesion and flexibility.
    - a. Products: Fortifiber Butyl Self-Adhering flashing.
  - 3. Mechanically Attached Membrane Flashing: Multi-layer composite of woven polypropylene fabric coated on both sides with ultraviolet-resistant polypropylene.
    - a. Products: Subject to compliance with requirements, provide the following: Fortifiber Building Systems Group; Moistop PF.
      - 1) Water Resistance: Not less than 130 hours when tested in accordance with ASTM D-779.
      - b. Tensile Strength: Not less than MD - 107 lb. per inch or CD - 76 lb./inch when tested in accordance with ASTM D-882.
      - c. Trapezoidal Tear: Not less than MD - 51 lb. per inch or CD - 41 lb./inch when tested in accordance with ASTM D-4533.
  - 4. Window Sill Corner Flashing: Preformed polyolefin membrane.
    - a. Products: Subject to compliance with requirements, provide the following:
      - 1) Fortifiber Building Systems Group; Moistop Corner Shield.
  - 5. Water Resistance: Not less than 48 hours when tested in accordance with ASTM D-779.

## 2.4 MISCELLANEOUS MATERIALS

- A. Sealant: As specified in Section 07 92 00 "Joint Sealants."
- B. Primer for Self-Adhering Membrane Flashing: Product recommended by manufacturer of self-adhering membrane flashing for substrate.

**PART 3 - EXECUTION****3.1 WEATHER-RESISTIVE BARRIER / AIR BARRIER INSTALLATION**

- A. Cover exposed exterior surface of sheathing with weather resistive barrier/air barrier securely fastened to framing immediately after sheathing is installed.
- B. Cover sheathing with weather resistive barrier/air barrier as indicated on Drawings and as follows:
  1. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations. Overlap vertical seams a minimum of 12" inches and horizontal seams a minimum of 6" inches.
  2. Start weather barrier / air barrier installation at a building corner, leaving 6 to 12 inches of weather barrier extended beyond corner to overlap
  3. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers.
  4. Maintain weather barrier plumb and level.
  5. Seal seams, edges, fasteners, and penetrations with tape.
  6. Install weather resistive barrier with cap fasteners, unless otherwise covered with furring strips.
  7. Return weather resistive barrier and air barrier into sill, jamb and head areas of openings as detailed on Drawings, with a combination of self adhered membrane, mechanically adhered membrane, additional weather resistive barrier strips, tape and sealant.
  8. Lap weather resistive barrier/air barrier over vertical leg of through-wall flashings to shed moisture.
  9. Seal any tears or cuts as recommended by manufacturer.
  10. Seal bottom of weather resistive barrier/air barrier to foundation as detailed on Drawings.
  11. Seal top of weather resistive barrier/air barrier to top plate as detailed on Drawings.
  12. All fasteners to be covered with furring, ledgers or tape. If fastner is exposed use tape to cover or use cap fastener.

**3.2 FLEXIBLE FLASHING INSTALLATION**

- A. Apply flexible flashing as indicated on Drawings and as follows:
  1. Comply with manufacturer's written instructions.
  2. Prime substrates prior to application of self-adhering membrane flashing.
  3. Isolate flashing materials from other building materials that could affect durability or adhesion of flashing products.
  4. 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.
  5. Lap flashing over weather resistive barrier at bottom and sides of openings.
  6. Lap weather resistive barrier over flashing at heads of openings.
  7. After self-adhering membrane flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.
- B. Apply flexible flashing at inside and outside corners.
  1. Apply 24" wide vertical strips of 25 mil flexible flashing at inside and outside corners of building, from sill plate to underside of roof framing.

- C. Apply flexible flashing beneath ledgers and above sills.
  - 1. Apply 40 mil flexible flashing at wall mounted ledgers and at door and window sills.
- D. Use High Temperature flexible flashing at locations indicated in Division 01, Section "Sheet Metal Flashing and Trim"
- E. Use Butyl flashing at areas requiring material with additional flexibility or adhesivness as approved by manufacturer's representative and Architect.

### 3.3 WALL PENETRATION FLASHING PANEL INSTALLATION

- A. Install flashing panels in accordance with manufacturer's written instructions.
- B. Plumbing, Electrical and HVAC Flashing Panels
  - 1. Select flashing panel required for specific penetration size and type.
  - 2. Push flashing panel over penetration with label facing to exterior to form weatherproof seal around pipe.
  - 3. Nail flashing panels to walls with corrosion-resistant nails at top of panels.
  - 4. Slide weather resistive barrier under bottom flange of flashing panel.
  - 5. Cut WRB at top of flashing panel creating a 45 degree 'keystone' flap.
  - 6. Flash sides of panel with 4 inch strips of flexible flashing, over edge of flashing panel and onto WRB at sides.
  - 7. Flash top of panel with 4 inch strip of flexible flashing to sheathing. Top of panel flashing to continue beyond side flashing 1 inch each side.
  - 8. Fold 'keystone' flap in WRB down and lap over the top of the flashing panel and flexible flashing at top of panel.
  - 9. Seal all free edges of WRB with recommended tape.

### 3.4 AIR BARRIER ASSEMBLY INSTALLATION

- A. Install all components of weather barrier system as required to provide a continuous air barrier assembly.
  - 1. Continuity of air-barrier system has been achieved throughout the building envelope.
  - 2. Continuous backing support of the air-barrier has been provided.
  - 3. Termination mastic or tape has been applied on all cut edges.
  - 4. Strips and transition strips have been firmly adhered to substrate.
  - 5. Compatible materials have been used.
  - 6. Metal flashings have been sealed on both sides. Bed flashing in sealant to air-barrier material underneath and tape to air-barrier material above.
  - 7. All penetrations have been sealed.

### 3.5 CLEANING AND PROTECTION

- A. Protect weather barrier/air barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
  - 1. Protect weather barrier/air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than recommended time period, remove and replace weather barrier/air barrier or install

- additional thickness air barrier after repairing and preparing the overexposed membrane according to manufacturer's written instructions.
2. Protect weather barrier/air barrier from contact with incompatible materials and sealants not approved by weather barrier/air barrier manufacturer.
  - B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 25 00

**SECTION 07 31 13 - ASPHALT SHINGLES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Asphalt shingle roofing.
2. Underlayment.
3. Roof vents.
4. Roof duct terminations
5. Metal flashing and trim.
6. Accessories

- B. Related Requirements:

1. Division 06, Section "Sheathing" for roof sheathing.
2. Division 07, Section "Sheet Metal Flashing and Trim" for flashings integral with roof system.

**1.3 DEFINITION**

- A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

**1.4 SUBMITTALS**

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

- B. Samples: For each exposed product and for each color and texture specified.

1. Asphalt Shingles: Full size.
2. Ridge Vent: 12-inch- (300-mm-) long Sample.
3. Stealth Vent: 12 inch

- C. Qualification Data: For Installer.

- D. Sample Warranty: For manufacturer's warranty.

**1.5 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For asphalt shingles to include in maintenance manuals.

**1.6 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- 1. Asphalt Shingles: 100 sq. ft. (9.3 sq. m) of each type, in unbroken bundles.

**1.7 QUALITY ASSURANCE**

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

**1.8 DELIVERY, STORAGE, AND HANDLING**

- A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.
- B. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
- C. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.
- D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

**1.9 FIELD CONDITIONS**

- A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

**1.10 WARRANTY**

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.

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

- a. Manufacturing defects.

- 2. Material Warranty Period: 40 years from date of Substantial Completion, prorated, with first 10 years nonprorated.

- 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to 110 mph (49 m/s) for 10 years from date of Substantial Completion.

4. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for 10 years from date of Substantial Completion.
  5. Workmanship Warranty Period: 10 years from date of Substantial Completion.
- B. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of asphalt-shingle roofing that fail in materials or workmanship within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

### 2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated Architectural Asphalt Shingles: ASTM D 3462/D 3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. CertainTeed Corporation; Landmark Series.
  2. Strip Size: Manufacturer's standard.
  3. Algae Resistance: Granules resist algae discoloration.
  4. Color and Blends: As selected by Architect from manufacturer's full range.
- B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles or site-fabricated units cut from asphalt-shingle strips. Trim each side of lapped portion of unit to taper approximately 1 inch (25 mm).

### 2.3 UNDERLayment MATERIALS

- A. Glass Reinforced Felt: ASTM D 6757, glass reinforced, asphalt-saturated organic felts, nonperforated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. CertainTeed Corporation; Roofer's Select, High Performance Underlayment.
- B. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970/D 1970M, minimum of 40-mil- (1.0-mm-) thick, slip-resisting, polyethylene-film-reinforced top surface laminated to

SBS-modified asphalt adhesive, with release backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. CertainTeed Corporation.
  - b. GAF Materials Corporation.
  - c. Owens Corning.
- C. Self-Adhering Sheet Underlayment, High Temperature: Minimum of 40-mil- (1.0-mm-) thick; with slip-resisting, polymer-film-reinforced or glass-reinforced top surface laminated to layer of butyl or SBS-modified asphalt adhesive; with release backing; cold applied; and evaluated and documented to be suitable for use for intended purpose under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. GAF Materials Corporation.
    - b. Grace, W. R. & Co. - Conn.
    - c. Owens Corning.
  2. Thermal Stability: Stable after testing at 240 deg F (116 deg C) according to ASTM D 1970/D 1970M.
  3. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C) according to ASTM D 1970/D 1970M.

#### 2.4 RIDGE VENTS

- A. Rigid Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent for use under ridge shingles.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Air Vent, Inc.; a Gibraltar Industries company; Shingle Vent IIA
    - b. Cor-A-Vent, Inc.: V-600
    - c. GAF Materials Corporation.; Cobra Ridge Vent (Snow Country)
    - d. Owens Corning; VentSure with WeatherProtector
  2. Minimum Net Free Area: manufacturer's standard.
  3. Width: manufacturer's standard.
  4. Thickness: manufacturer's standard.
  5. Features:
    - a. Nonwoven geotextile filter strips.
    - b. External deflector baffles.

## 2.5 LOW PROFILE CAP VENTS

- A. Low Profile Cap Vent - Passive: Aluminum, 'Stonecoat' textured finish, low profile, 'Stealth Vent', for passive venting.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Award Metals, Vancouver, Washington
  - 2. Minimum Net Free Area: manufacture's standard.
  - 3. Width: Manufacturer's standard.
  - 4. Thickness: Manufacturer's standard.

## 2.6 CAP VENTS

- A. Cap Vent - Static: Galvanized sheet steel, with bird screen for passive venting. Minimum net free area: 38 square inches. Sanded to match roofing system, color as selected by Architect. Number as required by attic ventilation requirements or as shown on Drawings, whichever is greater.
- B. Cap Vent - Duct Termination: Formed from galvanized sheet steel, with backflow damper, removable bird screen and duct attachment collar. Free area sized to accommodate duct and attached appliance capacity. Sanded to match roofing system, in color as selected by Architect.

## 2.7 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through OSB or plywood sheathing.
  - 1. Shank: as recommended by shingle manufacturer.
  - 2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Felt-Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.

## 2.8 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Division 07, Section "Sheet Metal Flashing and Trim."
  - 1. Sheet Metal: Zinc-tin alloy-coated steel.

- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item and as indicated in Division 01, Section "Sheet Metal Flashing and Trim."
1. Apron Flashings: Fabricate with lower flange a minimum of 4 inches and vertical flange 6 inches up the vertical surface.
  2. Step Flashings: Fabricate with a headlap of 2 inches (50 mm) and a minimum extension of 4 inches (100 mm) over the underlying asphalt shingle and 6 inches up the vertical surface.
  3. Cricket or Backer Flashings: Fabricate with concealed flange extending a minimum of 18 inches (450 mm) beneath upslope asphalt shingles and 6 inches (150 mm) beyond each side of skylight or other item and 6 inches (150 mm) above the roof plane.
  4. Open-Valley Flashings: Fabricate in lengths not exceeding 10 feet (3 m) with 1-inch-(25-mm-) high, inverted-V profile at center of valley and equal flange widths of 12 inches (300 mm).
  5. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 4-inch (50-mm) roof-deck flange and 1-1/2-inch (38-mm) fascia flange with 1/2-inch (12.5-mm) drip at lower edge. 'L' type at gutters.
  6. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 4-inch (50-mm) roof-deck flange and 1-1/2-inch (38-mm) fascia flange with 1/2-inch (12.5-mm) drip at lower edge. 'T' type at rakes and at non-guttered edges.
  7. Kick-Out Flashing: provide kick out flashings at the termination of roof/wall intersections as detailed in Drawings. Kick-Out flashings shall be shop fabricated as indicated on Drawings.
- C. Vent Pipe Flashings: Galvanized steel sheet base plate with flexible rubber collar sized to fit vent.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
  2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provisions have been made for flashings and penetrations through asphalt shingles.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 UNDERLayment INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Single-Layer Felt Underlayment: Install on roofs sloped greater than 4:12. Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with felt-underlayment nails.
  1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction that sheds water. Lap ends of felt not less than 6 inches (150 mm) over self-adhering sheet underlayment.
  2. Install fasteners at no more than 36 inches (914 mm) o.c.
- C. Double-Layer Felt Underlayment: Install on roof decks 4:12 and under. Install on roof deck parallel with and starting at the eaves. Install a 19-inch- (485-mm-) wide starter course at eaves and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches (485 mm) in shingle fashion. Lap ends a minimum of 6 inches (150 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with felt-underlayment nails.
  1. Apply a continuous layer of asphalt roofing cement over starter course and on felt-underlayment surface to be concealed by succeeding courses as each felt course is installed. Apply at locations indicated on Drawings.
  2. Install felt underlayment on roof sheathing not covered by self-adhering sheet underlayment. Lap edges over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction that sheds water.
  3. Terminate felt underlayment extended up not less than 4 inches (100 mm) against sidewalls, curbs, chimneys, and other roof projections.
  4. Install fasteners at no more than 36 inch (914 mm) o.c.
- D. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.
  1. Valleys: Extend from lowest to highest point 18 inches (450 mm) on each side.
- E. Metal-Flashed, Open-Valley Underlayment: Install two layers of minimum 36-inch- (914-mm-) wide underlayment centered in valley. Stagger end laps between layers at least 72 inches (1830 mm). Lap ends of each layer at least 12 inches (300 mm) in direction to shed water, and seal with asphalt roofing cement. Fasten each layer to roof deck.
  1. Lap roof-deck underlayment over first layer of valley underlayment at least 6 inches (150 mm).

### 3.3 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Division 07, Section "Sheet Metal Flashing and Trim."
  - 1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.
- C. Step Flashings: Install with a headlap of 2 inches (50 mm) and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.
- D. Cricket or Backer Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.
- E. Open-Valley Flashings: Install centered in valleys, lapping ends at least 8 inches (200 mm) in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.
  - 1. Secure hemmed flange edges into metal cleats spaced 12 inches (300 mm) apart and fastened to roof deck.
  - 2. Adhere 9-inch- (225-mm-) wide strip of self-adhering sheet to metal flanges and to self-adhering sheet underlayment.
- F. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.
- G. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.
- H. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

### 3.4 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip with tabs removed at least 7 inches (175 mm) wide with self-sealing strip face up at roof edge.
  - 1. Extend asphalt shingles 1/2 inch (13 mm) over fasciae at eaves and rakes.
  - 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

- D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.
- F. Fasten asphalt-shingle strips with a minimum of six roofing nails located according to manufacturer's written instructions.
  - 1. Where roof slope exceeds 21:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
  - 2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
  - 3. When ambient temperature during installation is below 50 deg F (10 deg C), seal asphalt shingles with asphalt roofing cement spots.
  - 4. Do not nail asphalt shingles within 6 inches (150 mm) of valley center.
- G. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Maintain uniform width of exposed open valley from highest to lowest point.
  - 1. Set valley edge of asphalt shingles in a 3-inch- (75-mm-) wide bed of asphalt roofing cement.
  - 2. Do not nail asphalt shingles to metal open-valley flashings.
- H. Cap Vents – Static: Install as indicated on Drawings.
- I. Cap Vents – Duct Termination: Install at all through the roof duct penetrations. Securely attach duct to cap vent with air tight connection.
- J. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
- K. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
  - 1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.
- L. Location of Vents: Do not locate any attic roof sheathing cut-outs within 4 feet of either side of a two-hour area separation wall.

END OF SECTION 07 31 13

**SECTION 07 46 46 – FIBER CEMENT SIDING and TRIM****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Fiber-cement siding.
2. Fiber-cement siding panels
3. Fiber-cement soffit.
4. Fiber-cement exterior trim.
5. Rainscreen furring and venting.
6. Fasteners.

- B. Related Sections:

1. Division 01, Section "Air Barrier System Coordination" for administrative requirements for responsibilities of the Contractor to accomplish an airtight building enclosure.
2. Division 06, Section "Rough Carpentry" for wood furring, grounds, nailers, and blocking.
3. Division 07, Section "Weather Resistive Barriers" for weather resistive barriers and accessories integral with the building enclosure system.
4. Division 07, Section "Sheet Metal Flashing and Trim" for flashings integral with the building enclosure system.
5. Division 07, Section "Joint Sealants" for sealants used in conjunction with siding.
6. Division 09, Section "Painting" for finish painting of factory primed siding.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Samples for Selection: For siding including related accessories.
  1. 12-inch- long-by-actual-width Sample for each type, color, texture and pattern required.
- C. Warranty: Sample of special warranty.

**1.4 CLOSE OUT SUBMITTALS**

- A. Maintenance Data: For each type of siding, soffit and rainscreen and related accessories to include in maintenance manuals.

**1.5 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with a protective covering for storage and identified with labels describing contents.
  - 1. Furnish full lengths of siding and soffit including related accessories, in a quantity equal to 2 percent of amount installed.

**1.6 QUALITY ASSURANCE**

- A. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.
- B. Source Limitations: Obtain each type, color, texture, and pattern of siding and soffit, including related accessories, from single source from single manufacturer.
- C. Mockups: Coordinate requirements for siding mockups with requirements for wall assembly mockup described in Division 07, Section "Weather Resistive Barriers."
  - 1. Construction of mockup will require out of sequence work for various trades.
  - 2. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
  - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- D. Preinstallation Conference: Conduct conference at Project site.

**1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials in a dry, well-ventilated, weathertight place.

**1.8 WARRANTY**

- A. Product Warranty: Standard form in which manufacturer agrees to repair or replace siding, soffit and trim products that fail(s) in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following: Structural failures including cracking, deforming.
  - 2. Lap and Vertical Siding and Soffit Product Warranty Period: 30 years from date of Substantial Completion.
  - 3. Trim Product Warranty Period: 15 years from date of Substantial Completion.

**PART 2 - PRODUCTS****2.1 FIBER-CEMENT SIDING AND TRIM**

- A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.
  - 1. Manufacturer's: Subject to compliance with requirements, provide products by one of the following:
    - a. James Hardie Building Products, Inc., HZ 10.
- B. Horizontal Lap Board Siding:
  - 1. Texture: Select Cedarmill at exposed face.
  - 2. Size: 5/16 inch thick, 12 ft. long boards.
  - 3. Exposure: as noted on Drawings.
- C. Panel Siding:
  - 1. Groove Pattern: None
  - 2. Texture: Stucco at exposed face.
  - 3. Size: 5/16 inch thick, 4 x 8 ft., 4 x 9 ft. or 4 x 10 ft. sheets as required.
- D. Soffit Panels:
  - 1. Groove Pattern: None
  - 2. Texture: Vented Cedarmill at exposed face.
  - 3. Size: 1/4 inch thick, 12 inch x 12 ft., 16 inch x 12 ft., 24 inch x 12 ft., or 4 x 8 ft. sheets as required.
  - 4. Ventilation: Provide un-perforated soffit unless otherwise indicated.
- E. Exterior Trim 5/4 (1 inch) cement fiber boards:
  - 1. Texture: Rustic Grain at exposed face.
  - 2. Size: 1 inch actual thickness, width as noted on Drawings, 10 ft. long boards.
  - 3. Back: No grooves at exposed fascia edges.
- F. Exterior Trim Batten Strips:
  - 1. Product: Manufactured batten strips
  - 2. Texture: Rustic Grain at exposed face.
  - 3. Size: 3/4 inch x 2-1/2 inches actual dimensions, 12 ft. long boards.
- G. Finish:
  - 1. Factory Primer: Manufacturer's standard acrylic primer.
  - 2. Topcoats: As specified in Division 09, Section "Painting".

**2.2 RAINSCREEN FURRING**

- A. Rain Screen Furring Strips: Exterior grade plywood, wood preservative treated, 1/2 inch thick by 2-inches wide.

- B. Borate (SBX) Preservative Treatment: Disodium octaborate tetrahydrate (DOT) treatment for insect and decay protective pressure treatment of wood, producing material meeting the following minimum standards:
1. Treatment Standard: AWPA 3B.
  2. Treatment Level: Borate preservative treatment minimum retention level of 0.42 pcf.
  3. Edge Treatment: Fully treated by cutting furring strips to width prior to preservative treatment process.
- C. Rainscreen Furring Fasteners: Stainless steel, size as specified on Drawings.

## 2.3 ACCESSORIES

- A. Joint Flashing at Lap Siding Field Butt Joints:
1. Material: Zinc-Coated (Galvanized) Steel Sheet; ASTM A 653/A 653M, G90 coating designation.
  2. Thickness: 0.0179 inch, 29 ga.
  3. Width: 6 inches.
  4. Finish: Pre-painted by coil-coating process to comply with ASTM A 755/ A 755M.
  5. Color: As selected by Architect from manufacturer's full range.
- B. Outside Corners at Lap Siding:
1. Product: Simplicity Tool; "Siding Corners."
  2. Material: Aluminum
  3. Thickness: 0.015 inch.
  4. Size: To match lap siding thickness and width.
  5. Finish: Factory-sprayed, baked-on primer suitable for field painting, 0.3 mil dry film thickness.
  6. Finish:
    - a. Pre-painted by coil-coating process with two coat fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat to comply with AAMA 620 and coating manufacturer's written instructions.
    - b. Color: As selected by Architect from manufacturer's full range.
- C. Trim at Panel Siding:
1. Extrusions: Extruded aluminum, alloy 6063 T5 with factory sprayed, baked-on primer suitable for field painting; 0.3 mil dry film thickness
  2.
    - a. Vertical Reveals: Fry Reglet; FCP - Vertical.
    - b. Inside Corner Reveals: Fry Reglet; FCP - Inside Corner
    - c. Outside Corner Reveals: Fry Reglet; FCP - Outside Corner
  3. Break Shape: 24 ga.steel galvanized and primed.
    - a. Horizontal: 'Z' profile as indicated on Drawings.
- D. Insect Screen: 18 x 16 mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D 3656.
- E. Concealed Vents: Corrugated plastic; Cor-A-Vent Siding vent with insect screen as noted on Drawings.

- F. Separator Material: Self adhered membrane per Division 07, Section "Weather Resistive Barriers".

## 2.4 FASTENERS

- A. To wood framing or furring: fiber cement plank siding .
1. Minimum: Fastener with minimum embedment in wood substrate as indicated in manufacturer's fastener schedule. Increase fastener length as required to accommodate non-wood materials. Obtain written confirmation fastener selection is appropriate for substrate from manufacturer's representative.
  2. Refer to manufacturer's applicable building code compliance reports for specific framing and fastener requirements as determined by maximum basic wind speed and exposure category.
  3. Material: Stainless steel nails.
- B. To wood framing and furring: fiber cement panels.
1. Minimum: Fastener with minimum embedment in wood substrate as indicated in manufacturer's fastener schedule. Increase fastener length as required to accommodate non-wood materials. Obtain written confirmation fastener selection is appropriate for substrate from manufacturer's representative.
  2. Refer to manufacturer's applicable building code compliance reports for specific framing and fastener requirements as determined by maximum basic wind speed and exposure category.
  3. Material: Stainless steel

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding and soffit and related accessories. Notify Architect of unsatisfactory substrate conditions in writing. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION - GENERAL

- A. Install blocking as required to attach trim, siding and rainscreen materials and accessories.
- B. Coordinate installation of weather barriers, flashings and adjoining construction to ensure proper sequencing.
- C. Cuts: Provide cut edges that are smooth, clean and straight. Make all cross cuts square to the material being cut unless otherwise indicated. Make all longitudinal cuts parallel to the edge of the siding unless otherwise indicated. Make all angled cuts parallel to adjacent surfaces unless otherwise indicated. Use squares, straight edges or guides as required to produce straight cut edges. Cuts shall not deviate from a straight line more than 1/16 inch over 96 inches. Do not overcut inside corners. Replace work that does not meet cut requirements.

### 3.3 INSTALLATION – WOOD STRIP RAINSCREEN FURRING

- A. General: Provide rain screen furring under all siding. Install over weather resistive barrier and opening flashings.
- B. Install furring strips vertically. Other than at wall openings, do not install horizontal furring that would impede the flow of moisture in the siding cavity.
- C. Locate furring strips directly over wall studs.
- D. Provide additional furring at jambs of wall openings.
- E. Provide air gap of  $\frac{1}{2}$  inch minimum between window trim furring and window frame at head and jambs.
- F. Provide a minimum of  $\frac{1}{2}$  inch minimum space between adjacent furring strips.

### 3.4 INSTALLATION - LAP SIDING

- A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.
- B. Install board siding lapped for natural watershed.
- C. Install siding using manufacturer's approved blind nailing techniques.
  - 1. Drive fasteners perpendicular to siding and framing.
  - 2. Fastener heads should fit snug against siding (no air space)
  - 3. Do not overdrive fasteners or drive at an angle.
  - 4. If nail is countersunk, fill nail hole and add another nail.
  - 5. Do not use aluminum fasteners, staples or clipped head nails.
  - 6. Nail along provided nail line or  $\frac{3}{4}$  inch to 1 inch below top of plank.
  - 7. Nail  $\frac{3}{8}$  inch from end of plank.
- D. Install in full length pieces where possible. Make every effort to minimize butt joints. Do not install any length under 4 feet, unless length of wall is less than 4 feet.
- E. Butt joints:
  - 1. Stagger butt joints. Alternate board lengths to avoid butt joint alignment within four (4) courses of siding.
  - 2. Do not 'stair step' butt joint offset, aim for random alignment.
  - 3. Position cut ends over stud locations or solid blocking.
  - 4. Install joint flashing material behind all butt joints.
  - 5. Install factory cut edges together at butt joints
  - 6. Install planks in moderate contact at butt joints
  - 7. Do not install sealant at field butt joints.
  - 8. Nail per manufacturer recommendations.
- F. Fasten siding in place with blind nailing, level and plumb. Nail into wood studs or solid blocking. Do not nail siding to sheathing.

- G. Kick Out Flashings: As detailed in Drawings.
- H. Clearances:
  - 1. Provide 1/8 inch gap between siding and corner, window and door trim. Seal weather tight per Division 07, Section "Joint Sealants" with properly dimensioned fillet joint.
  - 2. Maintain a minimum 1/4" clearance between the bottom of siding and horizontal flashing – do not caulk gap.
  - 3. Maintain a minimum of 6" between the bottom of siding and finished adjacent grade.
  - 4. Maintain a minimum of 1" gap between gutter end caps and siding and trim.
  - 5. Maintain a minimum of 2" vertical clearance between siding and decking, roofing, patios surfaces and sidewalks.
  - 6. Other clearances as required by manufacturer's installation instructions.

### 3.5 INSTALLATION, SOFFIT PANELS

- A. General: Comply with siding and soffit manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
  - 1. Do not install damaged components.
- B. Install fiber-cement siding and soffit and related accessories.
  - 1. Install fasteners no more than 24 inches o.c.
- C. Install joint sealants as specified in Division 07, Section "Joint Sealants" and to produce a weathertight installation.

### 3.6 INSTALLATION, PANEL SIDING

- A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.
- B. Coordination:
  - 1. Coordinate spacing of studs and rainscreen strips with panel reveals / battens.
  - 2. Center batten patterns and panel reveals on areas to be sided unless otherwise indicated on Drawings.
- C. Arrange joints as shown on Drawings. Align joints in adjacent panels to provide consistent joint lines around entire building.
- D. Locate edge joints centered over furring.
- E. Provide cut edges that are smooth and clean
- F. Reveal Trim: Install reveal trim per manufacturer's fastening and installation instructions. Install vertical trim plumb and horizontal trim level.
- G. Dissimilar Reveal Materials: When reveal materials are dissimilar provide self-adhered membrane separator material between dissimilar materials.

- H. Pre-Finished Panel Filler: Fill nail holes in pre-finished panels with colored matched filler recommended by pre-finished panel manufacturer. When using color matched filler at pre-finished panels completely wipe filler from area surrounding nail head or nail hole.

### 3.7 INSTALLATION - STANDING AND RUNNING TRIM

- A. Install trim level, plumb, true, and aligned with adjacent materials.
1. Scribe and cut exterior trim to fit adjoining work.
  2. Use concealed shims where necessary for alignment.
  3. Install to tolerance of 1/8 inch in 96 inches for level and plumb.
  4. Install adjoining exterior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
  5. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.
  6. Coordinate exterior trim with materials and systems in or adjacent to it.
  7. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.
  8. Rabbet vertical edges at corner trim and blind caulk vertical trim to trim joints.
  9. Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available.
  10. Do not use pieces less than 48 inches long except where necessary.
  11. Use scarf joints for end-to-end joints.
  12. Stagger end joints in adjacent and related members.
  13. Fit exterior joints to exclude water with angled 'weather cut'.
  14. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint.
- B. Unless otherwise indicated, countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.
- C. Trim Filler: Fill nail holes in trim with filler recommended by manufacturer. Strike smooth.

### 3.8 FIELD PRIMING OF SIDING AND TRIM

- A. Prime paint field cut ends of siding and trim using siding manufacturer's recommended primer.
- B. Allow primer to cure prior to installing materials.
- C. Prime siding and trim areas to receive sealant with sealant manufacturer's recommended primer when a primer is required to achieve satisfactory pull test results as indicated in Division 07, Section "Joint Sealants".

### 3.9 ADJUSTING AND CLEANING

- A. Touch-up exposed fasteners and field cuts with manufacturer approved finish.
- B. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

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

END OF SECTION 07 46 46

**SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Formed steep-slope roof sheet metal fabrications.
2. Formed siding and rainscreen sheet metal fabrications.
3. Roof drainage sheet metal fabrications.

- B. Related Requirements:

1. Division 01, Section "Air Barrier System Coordination" for administrative requirements for responsibilities of the Contractor to accomplish an airtight building enclosure.
2. Division 06, Section "Rough Carpentry" for wood furring, grounds, nailers, and blocking.
3. Division 07, Section "Weather Resistive Barriers" for flashings and accessories integral with the weather resistive barrier system.
4. Division 07, Section "Asphalt Shingles" for flashings and accessories integral with the roofing system.
5. Division 07, Section "Fiber Cement Siding" for flashings and accessories integral with the fiber cement siding system.
6. Division 07, Section "Joint Sealants" for sealants used in conjunction with flashing.
7. Division 09, Section "Painting" for finish painting of factory primed flashing.

**1.3 COORDINATION**

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

**1.4 SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

- B. Shop Drawings: For sheet metal flashing and trim.
1. Include plans, elevations, sections, and attachment details.
  2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
  3. Include identification of material, thickness, weight, and finish for each item and location in Project.
  4. Include details for forming, including profiles, shapes, seams, and dimensions.
  5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
  6. Include details of termination points and assemblies.
  7. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
  8. Include details of special conditions.
  9. Include details of connections to adjoining work.
  10. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches (1:5).
- C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- D. Samples: For each type of exposed finish.
1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
  2. Trim, Metal Closures, Expansion Joints, Saddles, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
  3. Samples may be incorporated in the Work after review.
- E. Qualification Data: For fabricator.
- F. Sample Warranty: For special warranty.

## 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

## 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Provide sheet metal flashing and trim components as required as part of mockups of other building assemblies where mockups of those assemblies are required elsewhere in the Specifications.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

#### 1.8 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
  1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  2. Finish Warranty Period: 20 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Recycled Content of Steel-Sheet Flashing and Trim: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

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

## 2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed; with smooth, flat surface.
  1. Finish: 2D (dull, cold rolled).
- C. Prefinished - Metallic-Finished Steel Sheet: Provide zinc-finished (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation; prefinished by coil-coating process to comply with ASTM A 755/A 755M.
  1. Surface: Smooth, flat.
  2. Prefinished: Exposed Coil-Finished Finish. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply finish to exposed metal surfaces to comply with finish and resin manufacturers' written instructions.
  3. Color: as selected from manufacturer's full range.
  4. Concealed Finish: Manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat.
- D. Preprimed - Metallic-Finished Steel Sheet: Provide zinc-finished (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation; pre-primed by coil-coating process to comply with ASTM A 755/A 755M.
- E. Pretreated - Metallic-Finished Steel Sheet: Provide zinc-finished (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation. Mill phosphatized and bonderized for field painting.

## 2.3 UNDERLayment MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Carlisle Residential, a division of Carlisle Construction Materials; WIP 300HT.

- b. Grace Construction Products, a unit of W. R. Grace & Co.-Conn.; Grace Ice and Water Shield HT Ultra.
  - c. Henry Company; Blueskin PE200 HT.
  - d. Fortifiber High Temperature Fortiflash Butyl
  - e. Approved Substitution.
- 2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
  - 3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

#### 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
  - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
    - c. Screws and Ferrules: Same material as gutter; with screw with ferrule matching internal gutter width.
  - 2. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- C. Solder:
  - 1. For Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
  - 1. Products:
    - a. Schnee-Morehead Inc; SM5227 Tacky Tape Sealant.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight. Color to match flashing finish.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release nitrile butyl rubber sealant:
  - 1. Products:

- a. The Ruscoe Company; 12-1, 12-2, 12-3.
- G. Masonry Anchors: Durable Component Tech (DCT); Rawl Zamac Nailin;  $\frac{1}{4}$  by  $1\frac{1}{2}$  inch.

## 2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
  - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  - 2. Obtain field measurements for accurate fit before shop fabrication.
  - 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
  - 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of  $\frac{1}{4}$  inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within  $\frac{1}{8}$ -inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
  - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
  - 2. Use lapped expansion joints only where indicated on Drawings.
- E. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- G. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength. Provide standing seams at roof copings.
- I. Do not use graphite pencils to mark metal surfaces.

## 2.6 GUTTER AND DOWNSPOUT FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
  - 1. Gutter Profile: Style 'F' according to cited sheet metal standard, or profile shown on Drawings.
  - 2. Expansion Joints: Butt type with cover plate.
  - 3. Attachment: 8 inch square drive galvanized gutter screws with ferrules.
  - 4. Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following materials:
    - a. Galvanized Steel: 0.022 inch (0.56 mm) thick, 26 ga pre-finished.
- B. Downspouts: Fabricate rectangular downspouts to 2 x 3 inches complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.
  - 1. Hanger Style: Straps.
  - 2. Fabricate from the following materials:
    - a. Galvanized Steel: 0.022 inch (0.56 mm) thick, 26ga pre-finished.

## 2.7 SHEET METAL FABRICATIONS

- A. General: Fabricate continuous flashings in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, as shown on Drawings.
  - 1. Form crimped upturned end dams at flashing terminations.
  - 2. Fabricate vertical faces with 1 inch minimum down leg with bottom edge formed outward with  $\frac{1}{2}$ " hem to provide drip.
  - 3. Fabricate shapes as shown on drawings.
  - 4. Shop fabricate corners from two interlocking pieces of flashing and cut to fit flashing profile to form one continuous edge at corner. Each leg 24 inches minimum. Pop rivet or clinch lock and seal with sealant.
  - 5. Fabricate saddles from stainless steel and solder as shown on drawings.
  - 6. Do not allow any anchorage or other penetrations through horizontal flashing surfaces.
  - 7. Fabricate all vertical legs to be overlapped with WRB 4" long.
  - 8. Fabricate all sloped flashing surfaces at seven (7) degree down-angle.
  - 9. Clinch lock and seal all fabrications not soldered.
- B. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
  - 1. Galvanized Steel: 0.022 inch (0.56 mm), thick, 26 ga pre-finished.
- C. Window Drip Edges: Fabricate from the following materials:
  - 1. Galvanized Steel: 0.022 inch (0.56 mm) thick, 26 ga pre-finished.
- D. Building Flashing: Fabricate from the following materials.
  - 1. Galvanized Steel 0.022 inch (0.56 mm) thick, 26 ga pre-finished.

- E. Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:
  - 1. Galvanized Steel: 0.022 inch (0.56 mm) thick, 26 ga pre-finished.
- F. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
  - 1. Galvanized Steel: 0.022 inch (0.56 mm) thick, 26 ga pre-finished.
- G. Flashing Receivers: Fabricate from the following materials:
  - 1. Galvanized Steel: 0.022 inch (0.56 mm) thick, 26 ga pre-finished.
- H. Saddle Flashing, threshold sill pans: Fabricate (soldered) from the following materials:
  - 1. Stainless Steel: 0.018 inch (0.46 mm) thick, 22 ga.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
  - 1. Verify compliance with requirements for installation tolerances of substrates.
  - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
  - 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 UNDERLayment INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures or as required for adhesion. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

#### 3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  - 1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
  4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
  5. Torch cutting of sheet metal flashing and trim is not permitted.
  6. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
  2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
  2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws or penetrate the substrate not less than the manufacturer recommended amount to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
  2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."

- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder metallic-finished steel and aluminum sheet.
  2. Do not use torches for soldering.
  3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
  4. Stainless-Steel Soldering: Tin edges of unfinished sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

- H. Rivets: Rivet joints where necessary for strength.

### 3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters: Join sections with joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
1. Anchor gutter with gutter screws and ferrels spaced not more than 30 inches (760 mm) apart.
  2. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.
  3. Slope gutters to drain to downspouts with no standing water.
  4. Completely embed top flanges in roofing cement.
  5. Maintain 1 inch gap minimum between gutter end caps and siding and trim.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.
1. Provide hangers with fasteners designed to hold downspouts securely. Provide downspout hangers designed to support downspouts securely 1 inch from face of walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.
  2. Connect downspouts to underground drainage system.
- D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches (100 mm) in direction of water flow.

### 3.5 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

**3.6 WALL FLASHING INSTALLATION**

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated.
- B. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- C. Install soldered stainless steel saddle flashing at all intersections of copings, beams, half walls and similar projecting components with vertical surfaces. Provide 4 inch flanges in each saddle direction unless otherwise noted.

**3.7 WINDOW AND DOOR FLASHING**

- A. Install stainless steel threshold pans at all doors.
- B. Install window and door head and sill flashing as shown on Drawings. All window head and sill flashing to have end dams.
- C. All door head flashing to have end dams.

**3.8 ERECTION TOLERANCES**

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

**3.9 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.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00

**SECTION 07 84 13 - PENETRATION FIRESTOPPING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.
4. Primers
5. Accessories

- B. Related Sections:

1. Division 01, Section "Delegated Design and Deferred Submittals" for administrative requirements for responsibilities of the Contractor.
2. Division 07, Section "Joint Sealants" for coordination with firestopping systems.
3. Division 09, Section "Gypsum Board" for coordination with firestopping systems.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.
1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- C. Qualification Data: For qualified Installer.
- D. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
- B. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:
  - 1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
  - 2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
    - a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
    - b. Classification markings on penetration firestopping correspond to designations listed by the following:
      - 1) UL in its "Fire Resistance Directory."

#### 1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

#### 1.6 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.
- C. Notify Owner's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Hilti, Inc.
  2. Specified Technologies Inc.
  3. 3M Fire Protection Products.

### 2.2 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
  1. Fire-resistance-rated walls include fire walls fire-barrier walls smoke-barrier walls and fire partitions.
  2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
  1. Horizontal assemblies include floors floor/ceiling assemblies and ceiling membranes of roof/ceiling assemblies.
  2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
  3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
  1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.
- E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.
- F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

- G. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Sealants: 250 g/L.
  2. Sealant Primers for Nonporous Substrates: 250 g/L.
  3. Sealant Primers for Porous Substrates: 775 g/L.
- H. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- I. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
1. Permanent forming/damming/backing materials, including the following:
    - a. Slag-wool-fiber or rock-wool-fiber insulation.
    - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    - c. Fire-rated form board.
    - d. Fillers for sealants.
  2. Temporary forming materials.
  3. Substrate primers.
  4. Collars.
  5. Steel sleeves.

### 2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescence Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescence Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
  - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.
- K. Putty Pads: Intumescent, mouldable for use with electrical boxes.

## 2.4 MIXING

- A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

### 3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
  2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
  3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

### 3.3 INSTALLATION

- A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- C. Install fill materials for firestopping by proven techniques to produce the following results:
1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
  2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
- D. Install firestop putty pads at electrical outlet boxes in fire-rated walls when required by code.

### 3.4 IDENTIFICATION

- A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

### 3.5 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections.
- B. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.
- C. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

### 3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 84 13

**SECTION 07 92 00 - JOINT SEALANTS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Polyether joint sealants.
4. Latex joint sealants.
5. Acoustical joint sealants.
6. Backer rod
7. Primers
8. Cleaners

- B. Related Requirements:

1. Division 01, Section "Quality Requirements" for administrative requirements for responsibilities of the Contractor.
2. Division 01, Section "Air Barrier System Coordination" for sealants integral with building enclosure system.
3. Division 07, Section "Weather Resistive Barriers" for sealants integral with building enclosure system
4. Division 07, Section "Fiber Cement Siding" for sealants integral with building enclosure system.
5. Division 07, Section "Sheet Metal Flashing and Trim" for sealants integral with building enclosure system.
6. Division 07, Section "Penetrating Firestopping" for sealing penetrations in fire-resistive rated construction.

**1.3 PREINSTALLATION MEETINGS**

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

**1.4 SUBMITTALS**

- A. Product Data: For each joint-sealant product.

B. Samples:

1. Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
2. Sample of sanded sealant joint. Sand color as approved by Architect.

C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

D. Field-Adhesion-Test Reports: For each sealant application tested.

E. Sample Warranties: For special warranties.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

## 1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
  1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
  2. Conduct field tests for each kind of sealant and joint substrate.
  3. Notify Architect seven days in advance of dates and times when test joints will be erected.
  4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
    - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
      - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
  5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.

6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
7. Provide substrate primer recommended by sealant manufacturer when primer is required to achieve satisfactory adhesion.
8. Verify that sealant primers do not prevent adhesion of paint to substrates or sealants.

#### 1.7 FIELD CONDITIONS

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

#### 1.8 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
  1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
  2. Disintegration of joint substrates from causes exceeding design specifications.
  3. Mechanical damage caused by individuals, tools, or other outside agents.
  4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## PART 2 - PRODUCTS

### 2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:
  - 1. Architectural sealants shall have a VOC content of 250 g/L or less.
  - 2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
  - 3. Sealants and sealant primers for nonporous substrates shall have a VOC content of 775 g/L or less.
- C. Low-Emitting Interior Sealants: Sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- D. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

### 2.2 SEALANTS

- A. Joint Sealant Type JS-1: Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use M, A, G, O. When siding is pre-finished, color match sealant to siding.
  - 1. BASF Building Systems; Sonolastic 150 VLM.
- B. Joint Sealant Type JS-2: Single-Component, Nonsag, Polyether Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for use with weather barriers.
  - 1. Fortifiber Building Systems Group; Moistop Sealant.
- C. Joint Sealant Type JS-3: Single-Component, Pourable, Traffic-Grade and Non-traffic use, plus 100 percent and minus 50 percent movement capability, Silicone Joint Sealant: ASTM C 920, Type S, Grade P, Class 100/50, for Use T and NT.
  - 1. Dow Corning; 890 SL Silicone
- D. Joint Sealant Type JS-4: Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
  - 1. BASF Building Systems; Sonolac.
  - 2. Sherwin Williams: 850A.
  - 3. Tremco Incorporated; Tremflex 834.

- E. Joint Sealant Type JS-5: Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
  - 1. GE Construction Sealants.; RCS20 Acoustical.
  - 2. USG Corporation; SHEETROCK Acoustical Sealant.
  - 3. Tremco Incorporated; Tremco Acoustical Sealant.
- F. Joint Sealant Type JS-6: One part, Mildew-Resistant Silicone Sealant: ASTM C920; Type S, Grade NS, Class 25; Uses NT, G, A and as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
  - 1. Dow Corning Corporation; Dow Corning 786.
  - 2. GE Silicones; Sanitary SCS 1700.
  - 3. Tremco, Incorporated; Tremsil 200 Sanitary.

## 2.3 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type B (Bi-cellular material), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Non-absorbing outer skin and resilient interior network of both open and closed cells that does not out gas when ruptured.
  - 1. Nomaco; SOF Rod
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

## 2.4 MISCELLANEOUS MATERIALS

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

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

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
  3. Remove laitance and form-release agents from concrete.
  4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
  - 4. Cut sealant backers at corners, do not bend around corners.
  - 5. Braiding sealant backings to produce a larger backing is strictly prohibited.
  - 6. Dissimilar sealant backings used in a single application are strictly prohibited.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Use metal or plastic blade tool approved by sealant manufacturer.
  - 4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193 unless otherwise indicated.
  - 5. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
    - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

#### 3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
  - 1. Extent of Testing: Test completed and cured sealant joints as follows:
    - a. Perform 3 tests for each kind of sealant and joint substrate per elevation and per floor.
  - 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

- a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
  3. Inspect tested joints and report on the following:
    - a. Whether sealants filled joint cavities and are free of voids.
    - b. Whether sealant dimensions and configurations comply with specified requirements.
    - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
  4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
  5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

### 3.5 CLEANING

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

### 3.6 PROTECTION

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

**3.7 JOINT-SEALANT SCHEDULE**

1. JS-1: General exterior joints in vertical surfaces and horizontal nontraffic surfaces.
2. JS-2: Perimeter joints between weather barrier materials and door frames, window frames, vents and louvers. Bedding joints between self-adhered membrane flashings and window nail flanges.
3. JS-3: Joints in concrete sidewalks.
4. JS-4: General interior joints.
5. JS-5: Joints in interior, acoustically rated assemblies.
6. JS-6: Joints in wet locations and ceramic tile.

END OF SECTION 07 92 00

**SECTION 08 14 16 - FLUSH WOOD DOORS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Hollow-core doors with MDF or hardboard faces.
2. Factory priming flush wood doors.

- B. Related Requirements:

1. Division 06, Section "Interior Architectural Woodwork" for wood door frames.
2. Division 08, Section "Door Hardware" for coordination with doors.

**1.3 SUBMITTALS**

- A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

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

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts.
5. Doors to be factory finished and finish requirements.

- C. Sample Warranty: For special warranty.

- D. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

**1.4 QUALITY ASSURANCE****1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of referenced standard and manufacturer's written instructions.

- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

#### 1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during remainder of construction period.

#### 1.7 WARRANTY

- A. A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
    - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
  - 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
  - 3. Warranty Period for Hollow-Core Interior Doors: Two years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Western Oregon Door
  - 2. Vancouver Door Company.
  - 3. Lynden Door
  - 4. Masonite

- B. Source Limitations: Obtain flush wood doors from single manufacturer.

#### 2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

1. Provide AWMA Certified Compliance Labels indicating that doors comply with requirements of grades specified.
  2. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.
- B. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.
- C. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Hollow-Core Doors:
1. Construction: Institutional hollow core.
  2. Blocking: Provide wood blocking with minimum dimensions as follows:
    - a. 5-by-18-inch (125-by-460-mm) lock blocks at both stiles.
    - b. 5-inch (125-mm) top-and bottom-rail blocking.
    - c. 2-1/2-inch (64-mm) midrail blocking.
    - d. 5-by-5 inch robe hook blocking as required.

### 2.3 VENEER-FACED DOORS FOR PAINTED FINISH

- A. Interior Hollow-Core Doors:
1. Grade: Premium.
  2. Faces: MDF or hardboard.
  3. Core: Standard honeycomb.
  4. WDMA I.S.1-A Performance Grade: Standard Duty.

### 2.4 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.

### 2.5 SHOP PRIMING

- A. Doors for Opaque Finish: Shop prime all faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Section 09 91 20 "Painting."

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
  1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
  2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Hardware: For installation, see Section 08 71 00 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
  1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
    - a. Comply with NFPA 80 for fire-rated doors.
    - b. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
  2. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

### 3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 14 16

**SECTION 08 22 50 – FIBERGLASS FACED DOORS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes but is not limited to:

1. Fiberglass clad doors for exterior use.
2. Factory priming
3. Frame
4. Weatherstripping
5. Thresholds
6. Glazing / Internal blinds

- B. Related Sections:

1. Division 01, Section "Air Barrier Requirements" for administrative requirements related to the building enclosure.
2. Division 07, Section "Weather Resistive Barriers" for flashing at rough openings for doors.
3. Division 07, Section "Joint Sealants" for sealants and caulking.
4. Division 08, Section "Door Hardware" for door hardware, thresholds and weatherstripping.
5. Division 09, Section "Painting" for field painting factory primed doors and frames.

**1.3 PREINSTALLATION MEETINGS**

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

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review, discuss, and coordinate the interrelationship of fiberglass doors with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealants, and protecting finishes.
3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.
5. Install typical door during pre-installation conference in coordination with other components of the Work.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for fiberglass doors.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Product Schedule: For fiberglass doors. Use same designations indicated on Drawings.
- D. Qualification Data: For manufacturer and Installer.
- E. Sample Warranties: For manufacturer's warranties.
- F. Manufacturer's installation instructions.
- G. Delegated-Design Submittal: Analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - 1. Code required design pressures for all fiberglass doors and locations.
  - 2. Detail fabrication, assembly and anchoring of systems.
  - 3. Include design calculations.

#### 1.5 DOOR PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01, Section "Delegated Design and Deferred Submittal Requirements" to establish:
  - 1. Code required design pressures for all door type and door locations.
  - 2. Verify door provided meets code required design pressures and applicable AAMA/WDMA/CAS requirements.
  - 3. Detail fabrication, assembly and anchoring of doors.

#### 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating fiberglass doors that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.
- B. Installer Qualifications: An installer acceptable to fiberglass door manufacturer for installation of units required for this Project.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Build mockup of typical wall area as shown on Drawings. Coordinate door mock-up with other related components of the Work requiring mock-ups.

2. Wall area with door mock-up may not be incorporated as part of the Work. Door mock-up to remain on site for reference for duration of Project's exterior envelope installation. Remove mock-up only with approval of Architect.
3. Install typical door as part of pre-installation conference.
4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

#### 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage, and notify shipper and supplier if damage is found. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect. Remove and replace damaged items that cannot be repaired as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch- high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber. If door packaging becomes wet, remove cartons immediately. Provide minimum 1/4-inch spaces between stacked doors to permit air circulation.
- D. Keep on-site handling to a minimum. Exercise particular care to avoid damage to finishes. Damaged or deteriorated materials shall be removed from the site.

#### 1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of surrounding construction by field measurements so structure will be accurately fitted to door components. Contractor, fabricator and manufacturer shall cooperate to establish and maintain these field dimensions.

#### 1.9 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace fiberglass doors that fail in materials or workmanship including parts and labor within specified warranty period.
  1. Failures include, but are not limited to, the following:
    - a. Failure to meet performance requirements.
    - b. Structural failures including excessive deflection, water leakage, and air infiltration.
    - c. Faulty operation of door and hardware.
    - d. Deterioration of materials and finishes beyond normal weathering.
    - e. Failure of insulating glass.
  2. Warranty:
    - a. Door: 3 years from date of Substantial Completion.

- b. Glazing Units: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Therma-tru
  2. Jeld Wen
  3. Codel.
  4. Masonite
- B. Source Limitations: Obtain doors from single source from single manufacturer.
- C. Product Standard:
1. Comply with AAMA/WDMA/CSA 101/I.S.2/A440 (current edition) for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
  2. Door Certification:
    - a. Doors, profiles, components and materials to be certified under either:
      - 1) The AAMA Certification Program and be labeled with AAMA Gold Certification Label.
      - 2) The WDMA Hallmark Certification Program and indicated with label.
    - b. Door assemblies to comply with current Energy Star rating for applicable region and bear the regional Energy Star label.
    - c. Doors to be rated and labeled with NFRC label.
- D. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 (current edition) as follows:
1. Performance Class and Grade: Manufacturer to provide delegated design services as required to establish required performance class and grade of all doors and provide doors that comply with the required performance class and grade criteria per AAMA/WDMA/CSA 101/I.S.2/A440-08 and ASTM E330 (current editions.)
- E. Thermal Transmittance:
1. U-factor, Btu/sq. ft. x h x deg F (1.71 W/sq. m x K) and SHGC or current EnergyStar requirement, whichever is more stringent.
    - a. Greater than ½ lite: U-0.25 or less, SHGC-0.19 or less.
- F. Sound Transmission Class (STC): Rated for not less than 27 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
- G. Outside-Inside Transmission Class (OITC): Rated for not less than 23 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.

- H. Forced-Entry Resistance: Comply with CAWM 301-90.

## 2.2 FIBERGLASS FACED ENTRY DOORS

- A. Configuration: Solid, half-glass, paneled and flush configurations, as indicated on Drawings.
- B. Face: 1/16 inch thick fiberglass composite cladding. Composite to be formed with long fiber injection, incorporating multiple layers of resins, tinted resins, base colors and reinforcing materials.
- C. Door Thickness: 1-3/4"
- D. Face Texture: Smooth (No wood grain).
- E. Door Edges: Kiln-dried lumber or laminated structural lumber.
- F. Insulated Core: Polyurethane, foamed-in-place;
- G. Internal Styles and Rails: Kiln-dried lumber or laminated structural lumber.
- H. Hardware Blocking and Reinforcement: Solid kiln-dried lumber or laminated structural lumber.
- I. Glazing Stops: Molded or extruded fiberglass composite. Non-removable on exterior side of door. Verify profile does not interfere with door hardware functions.
- J. Relite Kit: Full or half-glass configurations with internal blinds, as indicated on Drawings. Provide accessible blinds at accessible units.
  - 1. Overall Glass Unit Thickness: One inch.
  - 2. Glass Thickness: 1/8 inch.
  - 3. Internal blinds: Tilt-only; white.
  - 4. Sealing System: Polyisobutylene glazing tape
- K. Glazing: Manufacturer's standard for performance requirements. Tempered.
- L. Sidelight: As shown on Drawings. Integral with door frame. Manufacturer's standard as indicated on Drawings. Tempered glass.
- M. Composite Frame: Manufacturer's full composite frame.
- N. Weather Stripping: Provide full-perimeter weather stripping as indicated on hardware schedule.
- O. Fasteners: As recommended by door manufacturer. Noncorrosive and compatible with door members, trim, hardware, anchors, and other components.
  - 1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.
- P. Sealants: Comply with requirements of AAMA 800.
- Q. Thresholds:

1. Provide accessible aluminum thresholds at all doors per hardware schedule.
  2. Threshold maximum  $\frac{1}{2}$ " inch high.
- R. Hinges: Provide hinges per hardware schedule.

## 2.3 FABRICATION

- A. General: Fabricate door and frame units to be rigid, neat in appearance, and free from defects including warp and buckle. Fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site.
- B. Clearances : Not more than 1/8 inch at jambs and heads, except not more than 1/4 inch between pairs of doors. Not more than 3/4 inch at bottom.
- C. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- D. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier.
  - a. Prepare doors and frames for hardware provided included as part of entry system and for hardware provided by others, as indicated in Section 08 71 00.
  - b. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware.
- E. Reinforce doors to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- F. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.
- G. Factory install glass and glazing materials in doors.

## 2.4 FINISHES

- A. Fiberglass Clad Doors: Manufacturer's standard, factory-applied prime coat, suitable for field paint application.
- B. Frames: Manufacturer's composite, factory-applied prime coat, suitable for field paint application.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install doors level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Erection Tolerances:
  - 1. Variations from Plumb:  $\pm 1/8"$  maximum in door height.
  - 2. Variations from Level:  $\pm 1/8"$  maximum in 10' run, non-cumulative.
  - 3. Variations from Square:  $\pm 3/16"$  maximum diagonally.

### 3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- B. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.
  - 1. Keep protective films and coverings in place until final cleaning.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- D. Protect door surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 08 22 50

**SECTION 08 32 13 – SLIDING VINYL FRAMED GLASS DOORS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes but is not limited to:

1. Sliding vinyl framed glass doors.
2. Sliding door glazing
3. Sliding door hardware
4. Accessories

- B. Related Sections:

1. Division 01, Section "Air Barrier Requirements" for administrative requirements related to the building enclosure.
2. Division 07, Section "Weather Resistive Barriers" for flashing at rough openings for doors.
3. Division 07, Section "Joint Sealants" for sealants and caulking.

**1.3 PREINSTALLATION MEETINGS**

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

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review, discuss, and coordinate the interrelationship of vinyl sliding doors with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealants, and protecting finishes.
3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.
5. Install typical sliding door during pre-installation conference in coordination with other components of the Work.
6. Manufacturer's representative to be present for sliding door pre-installation meeting and during sliding door mock-up installation.
7. Manufacturer's representative to verify in writing that installation procedure represented by mock-up is in compliance with manufacturer's recommended installation procedures.
8. Testing protocol.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for vinyl sliding doors.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Qualification Data: For manufacturer and Installer.
- D. Product Test Reports: For each type of vinyl sliding door, for tests performed by a qualified testing agency.
- E. Sample Warranties: For manufacturer's warranties.
- F. Manufacturer's installation instructions.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating vinyl sliding doors that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.
- B. Installer Qualifications: An installer acceptable to vinyl sliding door manufacturer for installation of units required for this Project.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Build mockup of typical wall area as shown on Drawings. Coordinate sliding door mock-up with other related components of the Work requiring mock-ups.
  - 2. Wall area with sliding door mock-up may not be incorporated as part of the Work. Sliding door mock-up to remain on site for reference for duration of Project's sliding door and siding installation. Remove mock-up only with approval of Architect.
  - 3. Install typical sliding door as part of pre-installation conference.
  - 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. A temporary covering shall protect exposed surfaces after completing fabrication of products.
- B. Deliver materials in manufacturer's original packaging with labels intact.
- C. Store sliding doors/elements vertically, inside, in a clean and dry location.

- D. Stacking shall be done in a way to prevent bending.
- E. Cover stacks in a manner to provide air circulation and to reasonably protect materials from damage.
- F. Keep on-site handling to a minimum. Exercise particular care to avoid damage to finishes. Damaged or deteriorated materials shall be removed from the site.

#### 1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of surrounding construction by field measurements so work will be accurately fabricated, and fitted to structure. Contractor, fabricator and manufacturer shall cooperate to establish and maintain these field dimensions.

#### 1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace vinyl sliding doors that fail in materials or workmanship including parts and labor within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Failure to meet performance requirements.
    - b. Structural failures including excessive deflection, water leakage, and air infiltration.
    - c. Faulty operation of movable sash and hardware.
    - d. Deterioration of materials and finishes beyond normal weathering.
    - e. Failure of insulating glass.
  - 2. Warranty:
    - a. Use: Commercial
    - b. Sliding door: 10 years from date of Substantial Completion.
    - c. Glazing Units: 20 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Ply Gem
  - 2. Jeld Wen
  - 3. Pella
  - 4. VPI
- B. Source Limitations: Obtain vinyl sliding doors from single source from single manufacturer.

C. Product Standard:

1. Comply with AAMA/WDMA/CSA 101/I.S.2/A440 (current edition) for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
2. Sliding door Certification:
  - a. Sliding doors, profiles, components and materials to be certified under either:
    - 1) The AAMA Certification Program and be labeled with AAMA Gold Certification Label.
    - 2) The WDMA Hallmark Certification Program and indicated with label.
  - b. Sliding door assemblies to comply with current Energy Star rating for applicable region and bear the regional Energy Star label.
  - c. Sliding doors to be rated and labeled with NFRC label.

D. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: LC.
  2. Minimum Performance Grade: 25.
- E. Thermal Transmittance: NFRC 100 maximum whole-sliding door U-factor of 0.28 Btu/sq. ft. x h x deg F (1.71 W/sq. m x K), or current EnergyStar requirement, whichever is more stringent.
- F. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-sliding door SHGC of 0.27.
- G. Sound Transmission Class (STC): Rated for not less than 28 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
- H. Outside-Inside Transmission Class (OITC): Rated for not less than 21 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.
- I. Visible Light Transmittance: Not less than 0.50.
- J. Sliding door Air Leakage, ASTM E 283: Sliding door air leakage when tested at 1.57 psf (25 mph) shall be 0.30 cfm/ft<sup>2</sup> of frame or less.
- K. Sliding door Water Penetration, ASTM E 547: No water penetration through sliding door at static pressure, after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot. Static pressure established by performance grade.
- L. Factory Mulling: Mulled sliding door assemblies to be rated for not less than performance of individual component sliding doors according to AAMA 450-06.
- M. Forced-Entry Resistance: Comply with CAWM 301-90.
- N. Product Condensation Resistance: Minimum of 55.

## 2.2 VINYL SLIDING DOORS

- A. Operating Types: Provide the operating types as shown on the Drawing Schedule in locations indicated on Drawings:
- B. Frames and Sashes: Impact-resistant, UV-stabilized PVC complying with AAMA/WDMA/CSA 101/I.S.2/A440.
  - 1. Finish: Integral color, from full range of manufacturer's standard colors.
  - 2. Gypsum Board Returns: Provide at interior face of frame.
- C. Glass: Clear annealed glass, ASTM C 1036, Type 1, Class 1, q3.
  - 1. Kind: Fully tempered.
- D. Insulating-Glass Units: ASTM E 2190, certified through IGCC as complying with requirements of IGCC.
  - 1. Glass: ASTM C 1036, Type 1, Class 1, q3.
    - a. Tint: Clear.
    - b. Kind: Fully tempered.
  - 2. Lites: Two.
  - 3. Filling: Fill space between glass lites with argon.
  - 4. Low-E Coating: as required to meet requirements.
- E. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
- F. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock sliding doors, and sized to accommodate sash weight and dimensions.
  - 1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
- G. Horizontal-Sliding Sliding door Hardware:
  - 1. Sill Cap/Track: Manufacturer's standard of dimensions and profile indicated; designed to comply with performance requirements indicated and to drain to the exterior.
  - 2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
  - 3. Roller Assemblies: Low-friction design.
  - 4. Night lock feature.
- H. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

- I. Fasteners: As recommended by sliding door manufacturer. Noncorrosive and compatible with sliding door members, trim, hardware, anchors, and other components.
  - 1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.
- J. Sealants: Comply with requirements of AAMA 800.

## 2.3 ACCESSORIES

- A. Sill Drainage Mesh: Woven plastic mesh suitable to provide sill drainage behind sliding door nail flange;
  - 1. Frost King - Thermwell Products Co. Inc., VX620 Plastic Gutter Guard.
- B. Shims: Size and shape suitable to provide sill drainage and structural support under sliding door.
  - 1. Polypropylene or Polystyrene U-shaped Shims; 6,000-8,000 psi according to ASTM D695.
  - 2. Adhesive-backed Dense Neoprene Setting Blocks; 80 - 85 Shore "A" hardness according to ASTM D-2240.
- C. For other accessories, flexible flashing and tapes refer to Division 07, Section "Weather Resistant Barrier"
- D. For sealants refer to Division 07, Section "Joint Sealants"

## 2.4 INSECT SCREENS

- A. General: Fabricate insect screens to fully integrate with sliding door frame. Provide screen for each operable exterior door. Screen wickets are not permitted.
- B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
  - 1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
  - 2. Finish for Interior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.
  - 3. Finish for Exterior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.
- C. Glass-Fiber Mesh Fabric: 18-by-14 (1.1-by-1.4-mm) or 18-by-16 (1.0-by-1.1-mm) mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D 3656.
  - 1. Mesh Color: Manufacturer's standard gray.

## 2.5 FABRICATION

- A. Fabricate vinyl sliding doors in sizes indicated. Include a complete system for assembling components and anchoring sliding doors.
  - 1. Frame and Sash Corners: Miter-cut, bonded & mechanically joined, and injected with sealant.
  - 2. Nail Fin: Integral to frame for all sliding door types. Non-integral fins subject to approval of architect, factory test and field test compliance with performance criteria.
  - 3. Drainage: Fabricate frames with internal drainage system and weeps to the exterior.
- B. Sliding door Combinations: All combined sliding door frames to be factory mulled.
- C. Fabricate sliding doors that can be re-glazed without dismantling sash framing.
- D. Glaze vinyl sliding doors in the factory.
- E. Weather strip each operable sash to provide weathertight installation.
- F. Hardware: Mount hardware through double walls of vinyl extrusions or provide corrosion-resistant reinforcement.
- G. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight sliding door installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing sliding doors, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.

- B. Install sliding doors level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Erection Tolerances:
  - 1. Variations from Plumb:  $\pm 1/8"$  maximum in sliding door height.
  - 2. Variations from Level:  $\pm 1/8"$  maximum in 10' run, non-cumulative.
  - 3. Variations from Square:  $\pm 3/16"$  maximum diagonally.
- D. Coordinate sliding door installation with Sliding door Sequencing Details in Drawings.

### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency:
  - 1. Owner will engage a qualified testing agency to perform tests and inspections.
  - 2. Contractor to coordinate work of testing with agency.
  - 3. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of installed doors shall take place as follows:
  - 1. Testing Methodology: Testing of doors for air infiltration and water resistance shall be performed according to AAMA 502-12 and ASTM E1105. Verify testing pressure per ASTM D331 reports.
  - 2. Air-Infiltration Testing:
    - a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.
    - b. Allowable Air-Leakage Rate: 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.
  - 3. Water-Resistance Testing:
    - a. Test Pressure: Full lab test pressure (3.75 psf) required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated. No field reduction.
    - b. Allowable Water Infiltration: No water penetration at interior side of unit.
  - 4. Testing Extent: Three doors of each type or 10 percent of each type, locations as selected by Architect and a qualified independent testing and inspecting agency. Doors shall be tested after perimeter sealants have cured.
  - 5. Test Reports: Prepared according to AAMA 502.
- C. Contractor to provide:
  - 1. On-site source of water within 150 feet of each test location.
  - 2. Access to the interior and exterior of the building, to include any lifts, staging, rigging and or scaffolding that may be necessary.

3. Clear, unobstructed access to the test openings; to include the removal and replacement of items such as interior rough framing, trim, finishes and fire/smoke protection.
  4. Repair of any damage that may result from the testing process.
- D. Contractor to notify the Architect, window installer and manufacturer's representative of the test schedule. The notice shall be given in writing a minimum of one week in advance of the scheduled test date.
- E. Remove and replace non-complying doors with new doors and retest as specified above. Repair by the manufacturer of non-complying windows may be allowed at the owner's discretion.
- F. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- G. Prepare test and inspection reports.

#### 3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- B. Clean exposed surfaces immediately after installing sliding doors. Remove excess sealants, glazing materials, dirt, and other substances.
  1. Keep protective films and coverings in place until final cleaning.
- C. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.
- D. Protect sliding door surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact sliding door surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 08 53 13

**SECTION 08 53 13 - VINYL WINDOWS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes but is not limited to:

1. Vinyl-framed windows.
2. Vinyl window glazing.
3. Window screens
4. Accessories

- B. Related Sections:

1. Division 01, Section "Air Barrier Requirements" for administrative requirements related to the building enclosure.
2. Division 07, Section "Weather Resistive Barriers" for flashing at rough openings for doors.
3. Division 07, Section "Joint Sealants" for sealants and caulking.

**1.3 PREINSTALLATION MEETINGS**

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

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review, discuss, and coordinate the interrelationship of vinyl windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealants, and protecting finishes.
3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.
5. Install typical window during pre-installation conference in coordination with other components of the Work.
6. Manufacturer's representative to be present for window pre-installation meeting and during window mock-up installation.
7. Manufacturer's representative to verify in writing that installation procedure represented by mock-up is in compliance with manufacturer's recommended installation procedures.
8. Review testing protocol.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for vinyl windows.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples: For vinyl windows and components required.
  - 1. Exposed Finishes: Color and finish
  - 2. Exposed Hardware: Color and finish
- D. Product Schedule: For vinyl windows. Use same designations indicated on Drawings.
- E. Qualification Data: For manufacturer and Installer.
- F. Product Test Reports: For each type of vinyl window, for tests performed by a qualified testing agency.
- G. Sample Warranties: For manufacturer's warranties.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating vinyl windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.
- B. Installer Qualifications: An installer acceptable to vinyl window manufacturer for installation of units required for this Project.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Build mockup of typical wall area as shown on Drawings. Coordinate window mock-up with other related components of the Work requiring mock-ups.
  - 2. Wall area with window mock-up may not be incorporated as part of the Work. Window mock-up to remain on site for reference for duration of Project's window and siding installation. Remove mock-up only with approval of Architect.
  - 3. Install typical window as part of pre-installation conference.
  - 4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

## 1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace vinyl windows that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
    - a. Failure to meet performance requirements.
    - b. Structural failures including excessive deflection, water leakage, and air infiltration.
    - c. Faulty operation of movable sash and hardware.
    - d. Deterioration of materials and finishes beyond normal weathering.
    - e. Failure of insulating glass.
  2. Warranty Period:
    - a. Window: 10 years from date of Substantial Completion.
    - b. Glazing Units: 20 years from date of Substantial Completion.
    - c. Use: Commercial

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. PlyGem
  2. JELD-WEN, Inc.
  3. Pella Corporation.
  4. VPI Inc.
- B. Source Limitations: Obtain vinyl windows from single source from single manufacturer.

### 2.2 WINDOW PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
1. Windows, profiles, components and materials to be certified under either:
    - a. The AAMA Certification Program and be labeled with AAMA Gold Certification Label.
    - b. The WDMA Hallmark Certification Program and indicated with label.
  2. Window assemblies to comply with current Energy Star rating for applicable region and bear the regional Energy Star label.
  3. Windows to be rated and labeled with NFRC label.
- B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: LC.
  2. Minimum Performance Grade: 35
- C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.28 Btu/sq. ft. x h x deg F (1.71 W/sq. m x K).
- D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.27.
- E. Sound Transmission Class (STC): Rated for not less than 25 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
- F. Outside-Inside Transmission Class (OITC): Rated for not less than 21 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.
- G. Factory Mulling: Mulled window assemblies to be rated for not less than specified performance of individual component windows according to AAMA 450-06.
- H. Forced-Entry Resistance: Comply with CAWM 301-90.
- I. Product Condensation Resistance: Minimum of 55.

### 2.3 VINYL WINDOWS

- A. Operating Types: Provide the operating types in locations indicated on Drawings:
- B. Frames and Sashes: Impact-resistant, UV-stabilized PVC complying with AAMA/WDMA/CSA 101/I.S.2/A440.
1. Finish: Integral color, white.
  2. Gypsum Board Returns: Provide at interior face of frame.
- C. Glass: Clear annealed glass, ASTM C 1036, Type 1, Class 1, q3.
1. Kind: Fully tempered where indicated on Drawings and as required by code.
- D. Insulating-Glass Units: ASTM E 2190, certified through IGCC as complying with requirements of IGCC.
1. Glass: ASTM C 1036, Type 1, Class 1, q3.
    - a. Tint: Clear.
    - b. Kind: Fully tempered where indicated on Drawings and as required by code.
  2. Lites: Two.
  3. Filling: Fill space between glass lites with argon.
  4. Low-E Coating: as required to meet requirements.
- E. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

F. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.

1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.

G. Projected Window Hardware:

1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E 405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.
  - a. Type and Style: As selected by Architect from manufacturer's full range of types and styles.
2. Hinges: Manufacturer's standard type for sash weight and size indicated.
3. Single-Handle Locking System: Operates positive-acting arms that pull sash into locked position. Provide one arm on sashes up to 29 inches (735 mm) tall and two arms on taller sashes.

H. Hung Window Hardware:

1. Counterbalancing Mechanism: Complying with AAMA 902, concealed, of size and capacity to hold sash stationary at any open position.
2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only. Provide custodial locks.
3. Tilt Hardware: Releasing tilt latch allows sash to pivot about horizontal axis to facilitate cleaning exterior surfaces from the interior.

I. Horizontal-Sliding Window Hardware:

1. Sill Cap/Track: Manufacturer's standard of dimensions and profile indicated; designed to comply with performance requirements indicated and to drain to the exterior.
2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
3. Roller Assemblies: Low-friction design.

J. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

K. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

## 2.4 ACCESSORIES

- A. Sill Drainage Mesh: Woven plastic mesh suitable to provide sill drainage behind window nail flange;
  - 1. Frost King - Thermwell Products Co. Inc., VX620 Plastic Gutter Guard.
- B. Shims: Size and shape suitable to provide sill drainage and structural support under window.
  - 1. Polypropylene or Polystyrene U-shaped Shims; 6,000-8,000 psi according to ASTM D695.
  - 2. Adhesive-backed Dense Neoprene Setting Blocks; 80 - 85 Shore "A" hardness according to ASTM D-2240.
- C. For other accessories, flexible flashing and tapes refer to Division 07, Section "Weather Resistant Barriers"
- D. For sealants refer to Division 07, Section "Joint Sealants"

## 2.5 INSECT SCREENS

- A. General: Fabricate insect screens to fully integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
- B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
  - 1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
  - 2. Finish for Interior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.
  - 3. Finish for Exterior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range Insert finish.
- C. Glass-Fiber Mesh Fabric: 18-by-14 (1.1-by-1.4-mm) or 18-by-16 (1.0-by-1.1-mm) mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D 3656.
  - 1. Mesh Color: Manufacturer's standard gray.

## 2.6 FABRICATION

- A. Fabricate vinyl windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- B. Glaze vinyl windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.
- D. Mullions: Provide mullions and cover plates, compatible with window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances

and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding the same design wind loads and water resistance rating of individual window units. Provide manufacturer's standard finish to match window units.

- E. Hardware: Mount hardware through double walls of vinyl extrusions or provide corrosion-resistant reinforcement.
- F. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Clean and prepare window frame and apply sealants to comply with requirements in Division 07, Section "Joint Sealants". Perform sealant pull test as noted in joint sealant section.

#### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.
  - 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.

B. Testing Services: Testing and inspecting of installed windows shall take place as follows:

1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502-12 and ASTM E1105. Verify testing pressure per ASTM D331 reports.
  2. Air-Infiltration Testing:
    - a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.
    - b. Allowable Air-Leakage Rate: 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.
  3. Water-Resistance Testing:
    - a. Test Pressure: Full lab test pressure (5.25 psf) required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated. No field reduction.
    - b. Allowable Water Infiltration: No water penetration at interior side of unit.
  4. Testing Extent: Mock-up window and three windows of each type or 10 percent of each type whichever number is greater, as selected by Architect and a qualified independent testing and inspecting agency. Windows shall be tested after perimeter sealants have cured. Owner reserves the right to test additional windows.
  5. Test Reports: Prepared according to AAMA 502.
- C. Testing Coordination: Coordinate testing with appropriate phase and completeness of work.
1. Windows to be tested after cladding system has been installed unless otherwise agreed.
  2. Windows to be tested before interior insulation, finishes and trim is installed unless otherwise agreed.
- D. Remove and replace non-complying windows with new windows and retest as specified above. Repair by the manufacturer of non-complying windows may be allowed at the owner's discretion.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or repaired windows with specified requirements.
- F. Prepare test and inspection reports..
- G. Contractor to provide:
1. On-site source of water within 150 feet of each test location.
  2. Access to the interior and exterior of the building, to include any lifts, staging, rigging and or scaffolding that may be necessary.
  3. Clear, unobstructed access to the test openings; to include the removal and replacement of items such as interior rough framing, trim, finishes and fire/smoke protection.
  4. Repair of any damage that may result from the testing process.

**3.4 ADJUSTING, CLEANING, AND PROTECTION**

- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- B. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.
  - 1. Keep protective films and coverings in place until final cleaning.
- C. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.
- D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 08 53 13

**SECTION 08 71 00 - DOOR HARDWARE****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes but is not limited to:

1. Mechanical door hardware for the following:

- a. Swinging doors.
- b. Sliding doors.
- c. Folding doors.

- B. Related Sections:

1. Division 08, Section "Flush Wood Doors" for hardware.
2. Division 08, Section "Fiberglass faced Doors" for hardware.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples: For exposed door hardware of each type required, in each finish specified, prepared on Samples of size indicated below. Tag Samples with full description for coordination with the door hardware schedule. Submit Samples before, or concurrent with, submission of door hardware schedule.

1. Sample Size: Full-size units.

- a. Full-size Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.

2. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

- a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
  - b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
  - c. Content: Include the following information:
    - 1) Identification number, location, hand, fire rating, size, and material of each door and frame.
    - 2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
    - 3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
    - 4) Fastenings and other pertinent information.
    - 5) Explanation of abbreviations, symbols, and codes contained in schedule.
    - 6) Mounting locations for door hardware.
    - 7) List of related door devices specified in other Sections for each door and frame.
  - 3. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.
- C. Qualification Data: For Installer and Architectural Hardware Consultant.
- D. Product Certificates: For electrified door hardware, from the manufacturer.
- 1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
- E. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.
- F. Warranty: Special warranty specified in this Section.

#### 1.4 CLOSEOUT SUBMITTALS

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

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.
  2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
  3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design and extent to that indicated for this project.
- C. Source Limitations: Obtain each type of door hardware from a single manufacturer.
- D. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.
- E. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
  1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at the tested pressure differential of 0.3-inch wg (75 Pa) of water.
- F. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- G. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines, ICC/ANSI A117.1, HUD's "Fair Housing Accessibility Guidelines", Uniform Federal Accessibility Standards (UFAS), ANSI A1117.1 2003, NFPA 101 and Oregon Structural Specialty Code (Current Edition).
  1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
  2. Comply with the following maximum opening-force requirements:
    - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
    - b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
    - c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
  3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high and 3/4 inch (19 mm) high for exterior sliding doors.
  4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- H. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01, Section "Project Management and Coordination." In addition to Owner Contractor,

and Architect, conference participants shall also include Installer's Architectural Hardware Consultant and Owner's security consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:

1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
2. Preliminary key system schematic diagram.
3. Requirements for key control system.
4. Requirements for access control.
5. Address for delivery of keys.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
- C. Deliver keys and permanent cores to Owner.

#### 1.7 COORDINATION

- A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- C. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

#### 1.8 WARRANTY

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

2. Warranty Period: Three years from date of Substantial Completion, unless otherwise indicated.
  - a. Exit Devices: Two years from date of Substantial Completion.
  - b. Manual Closers: 10 years from date of Substantial Completion.

## 1.9 MAINTENANCE SERVICE

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

# PART 2 - PRODUCTS

## 2.1 SCHEDULED DOOR HARDWARE

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

## 2.2 HINGES

- A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. IVES Hardware; an Ingersoll-Rand company.
    - b. Bommer Industries, Inc.
    - c. Stanley Commercial Hardware; Div. of The Stanley Works.

## 2.3 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
  - 1. Bored Locks: Minimum 1/2-inch (13-mm) latchbolt throw.
  - 2. Mortise Locks: Minimum 3/4-inch (19-mm) latchbolt throw.
  - 3. Deadbolts: Minimum 1-inch (25-mm) bolt throw.
- C. Lock Backset: 2-3/4 inches (70 mm), unless otherwise indicated.
- D. Lock Trim:
  - 1. Operating Device: Lever with escutcheons (roses).
- E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch. Dust proof.
  - 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
  - 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
  - 3. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.
- F. Bored Locks: BHMA A156.2; Grade 1; Series 4000.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Falcon Lock; An Ingersoll-Rand Company.
    - b. Corbin Russwin Architectural Hardware; n ASSA ABLOY Group Company.
    - c. Schlage Commercial Lock Division; an Ingersoll-Rand company.
    - d. Dorma
- G. Mortise Locks: BHMA A156.13; Security Grade 1; stamped steel case with steel or brass parts; Series 1000.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Falcon Lock; an Ingersoll-Rand company.
    - b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
    - c. Schlage Commercial Lock Division; an Ingersoll-Rand company.
    - d. Dorma Architectural Hardware.

## 2.4 EXIT DEVICES AND AUXILIARY ITEMS

- A. Exit Devices and Auxiliary Items: BHMA A156.3.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Falcon Lock; an Ingersoll-Rand company.
  - b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company..
  - c. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
  - d. Von Duprin; an Ingersoll-Rand company.
  - e. DORMA Architectural Hardware

## 2.5 LOCK CYLINDERS

- A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
  1. Manufacturer: Same manufacturer as for locking devices.
  2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Falcon Lock; an Ingersoll-Rand company.\*
    - b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
    - c. DORMA Architectural Hardware
    - d. SARGENT Manufacturing Company; an ASSA ABLOY Group company.
    - e. Schlage Commercial Lock Division; an Ingersoll-Rand company.
- B. Standard Lock Cylinders: BHMA A156.5; Grade 1; permanent cores that are interchangeable; face finished to match lockset.
- C. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
- D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

## 2.6 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference.
  1. No Master Key System: Only change keys operate cylinder.
  2. Master Key System: Change keys and a master key operate cylinders.
  3. Grand Master Key System: Change keys, a master key, and a grand master key operate cylinders.
  4. Great-Grand Master Key System: Change keys, a master key, a grand master key, and a great-grand master key operate cylinders.
  5. Existing System:
    - a. Master key or grand master key locks to Owner's existing system.
    - b. Re-key Owner's existing master key system into new keying system.
  6. Keyed Alike: Key all cylinders to same change key.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
  - a. Notation: "DO NOT DUPLICATE" or as required by Owner.
2. Quantity: In addition to one extra key blank for each lock, provide the following:
  - a. Cylinder Change Keys: Three.
  - b. Master Keys: Five.
  - c. Grand Master Keys: Five.
  - d. Great-Grand Master Keys: Five.

## 2.7 KEY CONTROL SYSTEM

- A. Key Control Cabinet: BHMA A156.5; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, 2 sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of number of doors on project plus 10 percent of the number of locks.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Key Boxes and Cabinets.
    - b. GE Security, Inc.
    - c. Lund Equipment Co., Inc.
    - d. MMF Industries.
  2. Wall-Mounted Cabinet: Cabinet with hinged-panel door equipped with key-holding panels and pin-tumbler cylinder door lock.
- B. Key Lock Boxes: Designed for storage of two keys, with tamper switches to connect to intrusion detection system.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. GE Security, Inc.
    - b. HPC, Inc.
    - c. Knox Company.
- C. Key Control System Software: BHMA A156.5, Grade 1; multiple-index system for recording and reporting key-holder listings, tracking keys and lock and key history, and printing receipts for transactions. Include instruction manual.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Best Access Systems; Div. of Stanley Security Solutions, Inc.
    - b. GE Security, Inc.

c. HPC, Inc.

## 2.8 SURFACE CLOSERS

- A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Falcon Lock; an Ingersoll-Rand company.\*
    - b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company.
    - c. DORMA Architectural Hardware; Member of The DORMA Group North America.
    - d. LCN Closers; an Ingersoll-Rand company.
    - e. SARGENT Manufacturing Company; an ASSA ABLOY Group company.

## 2.9 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: BHMA A156.16.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. IVES Hardware; an Ingersoll-Rand company.\*
    - b. Architectural Builders Hardware Mfg., Inc.
    - c. Stanley Commercial Hardware; Div. of The Stanley Works.
    - d. Trimco.

## 2.10 DOOR GASKETING

- A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. National Guard Products.
    - b. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    - c. Reese Enterprises, Inc.

**2.11 THRESHOLDS**

- A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. National Guard Products.
    - b. Pemko Manufacturing Co.; an ASSA ABLOY Group company.
    - c. Reese Enterprises, Inc.

**2.12 BI-PASSING / BI-FOLDING DOOR HARDWARE / POCKET DOOR**

- A. General: BHMA A156.14; complete sets including overhead rails, hangers, supports, bumpers, floor guides, and accessories indicated.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Stanley Commercial Hardware; Div. of The Stanley Works.
    - b. Hager Companies.
    - c. Johnson, L. E., Products, Inc.

**2.13 KICK PLATES**

- A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- (1.3-mm-) thick; with manufacturer's standard machine or self-tapping screw fasteners.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. IVES Hardware; an Ingersoll-Rand company.
    - b. Tice
    - c. Trimco.

**2.14 FABRICATION**

- A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.
1. Manufacturer's identification is permitted on rim of lock cylinders only.
- B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

- C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
  2. Fire-Rated Applications:
    - a. Wood or Machine Screws: For the following:
      - 1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
      - 2) Strike plates to frames.
      - 3) Closers to doors and frames.
    - b. Steel Through Bolts: For the following unless door blocking is provided:
      - 1) Surface hinges to doors.
      - 2) Closers to doors and frames.
      - 3) Surface-mounted exit devices.
  3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
  4. Fasteners for Wood Doors: Comply with requirements in DHI WDHS.2, "Recommended Fasteners for Wood Doors."
  5. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

## 2.15 FINISHES

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

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

### 3.2 PREPARATION

- A. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
- B. Wood Doors: Comply with DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."

### 3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
  1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  2. Custom Steel Doors and Frames: HMMA 831.
  3. Fiberglass and Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.
  1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as directed by Owner.
  2. Furnish permanent cores to Owner for installation.
- E. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
1. Configuration: Provide one power supply for each door opening with electrified door hardware.
- F. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."
- G. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- H. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- I. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- J. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

### 3.4 FIELD QUALITY CONTROL

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

### 3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
  2. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

### 3.6 CLEANING AND PROTECTION

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

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

### 3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Section 01 79 00 "Demonstration and Training."

### 3.8 FINISH

- A. Finish: All hardware to have BHMA 626 (US 26D) satin chrome, finish or as noted.

### 3.9 DOOR HARDWARE SCHEDULE

#### **HW SET: 01**

Unit Entry

EACH TO HAVE

3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	DEADLOCK	D241P	626	FAL
1	EA	PASSAGE SET	W101S QUANTUM	626	FAL
1	EA	DOOR STOP	WS 407 CCV	626	IVE
1	SET	SEALS	2525B (HEAD & JAMBS)	BRN	NG
1	EA	THRESHOLD	158 (offset saddle – accessible)	AL	PEM
1	EA	VIEWER	U698 (PROVIDE 2 AT ADA ACCESSIBLE UNITS, OMIT AT DOORS WITH LIGHT)	626	IVE

NOTE: OMIT STOP WHERE THERE IS NO WALL OR DOOR TO MAKE CONTACT.

#### **HW SET: 02**

Unit Interior Door – Bedroom or Storage

EACH TO HAVE

3	EA	HINGE	5BB1RC 3.5 X 3.5	626	IVE
1	EA	PASSAGE SET	W101S QUANTUM	626	FAL
1	EA	DOOR STOP	WS 407 CCV	626	IVE
3	EA	SILENCER	SR65	GRY	IVE

NOTE: OMIT STOP WHERE THERE IS NO WALL OR DOOR TO MAKE CONTACT.

**HW SET: 03**

Unit Interior Door- Bathroom

EACH TO HAVE:

3	EA	HINGE	5BB1RC 3.5 X 3.5	626	IVE
1	EA	PRIVACY LOCK	W301S QUANTUM	626	FAL
1	EA	DOOR STOP	WS 407 CCV	626	IVE
3	EA	SILENCER	SR65	GRY	IVE

NOTE: OMIT STOP WHERE THERE IS NO WALL OR DOOR TO MAKE CONTACT.

**HW SET: 04**

Bypass Doors

EACH TO HAVE:

1	SET	BYPASS HARDWARE	BPC150N	STA	
2	EA	FLUSH PULL	242	626	TR
2	EA	ADHESIVE NEOPRENE STOP			

**HW SET: 05**

Bifold Doors

EACH TO HAVE:

1	SET	BIFOLD HARDWARE	BFC125N	STA	
			Heavy Duty – 150 lb. capacity, double roller.		
2	EA	WIRE PULL	562-4	626	TR

**HW SET: 06**

Exterior Storage Closets, Fire Sprinkler Riser Closets

EACH TO HAVE:

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	626	IVE
1	EA	STOREROOM	W581S QUANTUM	626	FAL
1	SET	SEALS	2525B (HEAD & JAMBS)	BRN	NGP
1	EA	DR BTM RAIN DRIP	17	AL	NGP
1	EA	THRESHOLD	158 (offset saddle – accessible)	AL	PEM

**HW SET: 07**

Office Entry, Laundry Entry

EACH TO HAVE:

3	EA	HINGE	5BB1 4.5 X 4.5 NRP	626	IVE
1	EA	STOREROOM	W581S QUANTUM	626	FAL
1	EA	DOOR STOP	WS407CCV	626	IVE
1	SET	SEALS	2525B (HEAD & JAMBS)	BRN	NGP
1	EA	DR BTM RAIN DRIP	17	AL	NGP
1	EA	THRESHOLD	158 (offset saddle – accessible)	AL	PEM

END OF SECTION 08 71 00

**SECTION 09 29 00 - GYPSUM BOARD****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

- 1. Interior gypsum board.
  - 2. Texture finishes.

- B. Related Sections:

- 1. Division 06, Section "Rough Framing" for wood framing and furring supporting gypsum board assemblies.
  - 2. Division 07, Section "Thermal Insulation" for insulation and vapor retarders installed in assemblies that incorporate gypsum board.
  - 3. Division 09, Section "Painting" for primers applied to gypsum board.

**1.3 SUBMITTALS**

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

- B. Samples: For the following products:

- 1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.
  - 2. Textured Finishes: 12"x12" for each textured finish indicated and on same backing indicated for Work.

**1.4 QUALITY ASSURANCE**

- A. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

- 1. Install mockups for the following:

- a. Each level of gypsum board finish indicated for use in exposed locations.
    - b. Each texture finish indicated.

2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.
3. Simulate finished lighting conditions for review of mockups.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.5 DELIVERY, STORAGE AND HANDLING

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

#### 1.6 FIELD CONDITIONS

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

#### D. WARRANTY

1. Gypsum Board: 1 year materials
2. Batt: 1 year materials.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- C. Low-Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

## 2.2 GYPSUM BOARD, GENERAL

- A. Recycled Content of Gypsum Panel Products:
  - 1. Paper Facing: 100% post consumer recycled content.
  - 2. Core: 19 % recycled or synthetic content.
- B. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

## 2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Georgia-Pacific Gypsum LLC.
  - 2. National Gypsum Company.
  - 3. USG Corporation.
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
  - 1. Thickness: 5/8 inch (15.9 mm).
  - 2. Long Edges: Tapered.
- C. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
  - 1. Core: 5/8 inch (15.9 mm), Type X.
  - 2. Long Edges: Tapered.
  - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- D. Glass Mat Interior Gypsum Board: ASTM C 1658/C 1658M, with manufacturer's standard edges. With fiberglass mat laminated to both sides, for interior use.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Georgia-Pacific Gypsum LLC.
    - b. USG Corporation.
  - 2. Core: 5/8 inch (15.9 mm), Type X as required by fire-resistance-rated assembly indicated on Drawings.
  - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

## 2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
  - 1. Material:
    - a. Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.

2. Shapes:
  - a. Cornerbead.
  - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
  - c. L-Bead: L-shaped; exposed long flange receives joint compound.
  - d. Expansion (control) joint.

## 2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
  1. Interior Gypsum Board: Paper.
  2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
  3. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
  1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
  2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
    - a. Use setting-type compound for installing paper-faced metal trim accessories.
  3. Fill Coat: For second coat, use setting-type, sandable topping or drying-type, all-purpose compound.
  4. Finish Coat: For third coat, use setting-type, sandable topping or drying-type, all-purpose compound.
- D. Joint Compound for Exterior Applications:
  1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.
  2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

## 2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
  1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  2. Laminating adhesive shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
  - 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
  - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
  - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
  - 2. Recycled Content of Blankets: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 35 percent by weight.
- E. Acoustical Joint Sealant: As specified in Division 07, Section "Joint Sealants."
- F. Thermal Insulation: As specified in Division 07, Section "Thermal Insulation."
- G. Vapor Retarder: As specified in Division 07, Section "Thermal Insulation."
- H. L-Shaped Soffit Framing Angles: 2-1/2 inch x 2-1/2" x 20 ga galvanized sheet steel angles for soffit and corner framing.

## 2.7 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.
- B. Non-Aggregate Finish: Pre-mixed, vinyl texture finish for spray application.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. National Gypsum Company; Perfect Spray EM Texture.
    - b. USG Corporation; BEADEX FasTex Wall and Ceiling Spray Texture.
  - 2. Texture: Orange Peel.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

### 3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. All gypsum board to be screw applied.
- C. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- E. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- F. Form control and expansion joints with space between edges of adjoining gypsum panels.
- G. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
  - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.
  - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- I. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- J. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.
- K. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

L. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

M. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
  - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
  - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

N. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

O. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

P. Curved Surfaces:

1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch- (300-mm-) long straight sections at ends of curves and tangent to them.
2. For double-layer construction, fasten base layer to studs with screws 16 inches (400 mm) o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches (300 mm) o.c.

### 3.3 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
  1. Cornerbead: Use at outside corners.
  2. LC-Bead: Use at exposed panel edges.

### 3.4 MOISTURE AND MOLD RESISTANT GYPSUM BOARD

- A. Install at all wet locations and walls scheduled to receive plumbing fixtures.

### 3.5 GLASS-MAT INTERIOR GYPSUM BOARD

- A. Install at all attic and crawl space demising walls.

### 3.6 INSTALLING SOFFIT ANGLES

- A. General: Install metal soffit angles at soffit conditions as shown on Drawings. Use metal angle to reinforce inside and outside corners.

### 3.7 FINISHING GYPSUM BOARD

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

### 3.8 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.

### 3.9 PROTECTION

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

END OF SECTION 09 29 00

**SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Resilient base.
2. Resilient stair accessories.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples.
- C. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

**1.5 FIELD CONDITIONS**

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:
  1. 48 hours before installation.
  2. During installation.
  3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

- C. Install resilient products after other finishing operations, including painting, have been completed.

## 1.6 WARRANTY

- A. Warranty Period: Five (5) year limited warranty commencing on the date of substantial completion.

# PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. FloorScore Compliance: Resilient base shall comply with requirements of FloorScore certification.
- B. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

## 2.2 THERMOSET-RUBBER BASE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Burke Mercer Flooring Products, Division of Burke Industries Inc.
  2. Flexco.
  3. Roppe Corporation, USA.
- B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
  1. Style and Location:
    - a. Style A, Straight: Provide in areas with carpet.
    - b. Style B, Cove: Provide in areas with resilient flooring.
- C. Thickness: 0.125 inch (3.2 mm).
- D. Height: As indicated on Drawings.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed
- G. Inside Corners: Job formed.
- H. Colors: As selected by Architect from full range of industry colors.

## 2.3 RUBBER MOLDING ACCESSORY

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Roppe Corporation, USA.
  - 2. VPI, LLC, Floor Products Division.
- B. Description: Rubber accessories as required (carpet edge for glue-down applications, nosing for carpet, nosing for resilient flooring, reducer strip for resilient flooring, joiner for tile and carpet, transition strips)
- C. Profile and Dimensions: As indicated.
- D. Locations: Provide rubber molding accessories in areas indicated.
- E. Colors and Patterns: As selected by Architect from full range of industry colors.

## 2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
  - 1. Adhesives shall have a VOC content of 50 g/L or less except that adhesive for rubber stair treads shall have a VOC content of 60 g/L or less.
  - 2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are the same temperature as the space where they are to be installed.
  - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

### 3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. Job-Formed Corners:
  - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
    - a. Form without producing discoloration (whitening) at bends.
  - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches (76 mm) in length.
    - a. Miter or cope corners to minimize open joints.

### 3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
  2. Sweep and vacuum horizontal surfaces thoroughly.
  3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09 65 13

**SECTION 09 65 16 - RESILIENT SHEET FLOORING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes but is not limited to:
  - 1. Vinyl sheet flooring.
  - 2. Adhesives

**1.3 RELATED SECTIONS**

- A. Division 09, Section "Resilient Base and Accessories"

**1.4 SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples: In manufacturer's standard size of each different color and pattern of resilient sheet flooring required.
- C. Product Schedule: For resilient sheet flooring. Use same designations indicated on Drawings.
- D. Qualification Data: For Installer.

**1.5 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For each type of resilient sheet flooring to include in maintenance manuals.

**1.6 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Resilient Sheet Flooring: Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, in roll form and in full roll width for each type, color, and pattern of flooring installed.

**1.7      QUALITY ASSURANCE**

- A.    Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.
  - 1.    Engage an installer who employs workers for this Project who are trained or certified by resilient sheet flooring manufacturer for installation techniques required.

**1.8      DELIVERY, STORAGE, AND HANDLING**

- A.    Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store rolls upright.

**1.9      FIELD CONDITIONS**

- A.    Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C), in spaces to receive resilient sheet flooring during the following time periods:
  - 1.    72 hours before installation.
  - 2.    During installation.
  - 3.    72 hours after installation.
- B.    Maintain ambient humidity.
- C.    Adequately prep surfaces - surfaces should be clean and dry before material application.
- D.    Provide adequate lighting in work area
- E.    Close spaces to traffic during resilient sheet flooring installation.
- F.    Close spaces to traffic for 72 hours after resilient sheet flooring installation.
- G.    Install resilient sheet flooring after other finishing operations, including painting, have been completed.

**1.10     WARRANTY**

- A.    Warranty Period: Ten (10) year limited warranty commencing on the date of substantial completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient sheet flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. FloorScore Compliance: Resilient sheet flooring shall comply with requirements of FloorScore certification.
- C. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

### 2.2 VINYL SHEET FLOORING WITH BACKING

- A. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Armstrong World Industries, Inc.
  - 2. Congoleum Corporation.
  - 3. Forbo Industries, Inc.
- B. Product Standard: ASTM F 1303.
  - 1. Type (Binder Content): Type I, minimum binder content of 90 percent.
  - 2. Wear-Layer Thickness: Grade 1.
  - 3. Overall Thickness: As standard with manufacturer.
  - 4. Interlayer Material: None.
  - 5. Backing Class: Class B (nonfoamed plastic).
- C. Wearing Surface: Smooth.
- D. Sheet Width: As standard with manufacturer or 12 feet (3.6 m).
- E. Seamless-Installation Method: Chemically bonded or heat welded.
- F. Colors and Patterns: As selected by Architect from full range of industry colors.

### 2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.

1. Adhesives shall have a VOC content of 50 g/L or less.
  2. Adhesives shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- C. Seamless-Installation Accessories:
1. Chemical-Bonding Compound: Manufacturer's product for chemically bonding seams.
    - a. Bonding compound shall have a VOC content of 510 g/L or less.
    - b. Bonding compound shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- D. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient sheet flooring manufacturer.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient sheet flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet flooring.
- B. Concrete Substrates: Prepare according to ASTM F 710.
  1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.
  3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.

4. Moisture Testing: Proceed with installation only after substrates pass testing according to resilient sheet flooring manufacturer's written recommendations, but not less stringent than the following:
  - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of in 24 hours.
  - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient sheet flooring until it is the same temperature as the space where it is to be installed.
  1. At least 72 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

### 3.3 RESILIENT SHEET FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient sheet flooring.
- B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.
- C. Lay out resilient sheet flooring as follows:
  1. Maintain uniformity of flooring direction.
  2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in flooring substrates.
  3. Match edges of flooring for color shading at seams.
  4. Avoid cross seams.
- D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.
- E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.

- H. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Seamless Installation:
  - 1. Chemically Bonded Seams: Bond seams with chemical-bonding compound to permanently fuse sections into a seamless flooring. Prepare seams and apply compound to produce tightly fitted seams without gaps, overlays, or excess bonding compound on flooring surfaces.
  - 2. Install metal corners at inside and outside corners.

### 3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.
- B. Perform the following operations immediately after completing resilient sheet flooring installation:
  - 1. Remove adhesive and other blemishes from surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient sheet flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from flooring surfaces before applying liquid floor polish.
  - 1. Apply one coat.
- E. Cover resilient sheet flooring until Substantial Completion.

END OF SECTION 09 65 16

**SECTION 09 68 16 - SHEET CARPETING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Carpet with direct glue-down and stretch-in applications.
2. Carpet cushion.

- B. Related Requirements:

1. Division 09, Section "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet.

**1.3 SUBMITTALS**

- A. Product Data: For the following, including installation recommendations for each type of substrate:

1. Carpet: For each type indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
2. Carpet Cushion: For each type indicated. Include manufacturer's written data on physical characteristics and durability.

- B. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet: 12-inch- (300-mm-) square Sample.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.
3. Carpet Cushion: 6-inch- (150-mm-) square Sample.

- C. Product Schedule: For carpet and carpet cushion. Use same designations indicated on Drawings.

- D. Qualification Data: For qualified Installer.

- E. Sample Warranties: For special warranties.

**1.4 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For carpet to include in maintenance manuals. Include the following:
  1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
  2. Precautions for cleaning materials and methods that could be detrimental to carpet and carpet cushion.

**1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced Installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

**1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with CRI 104.

**1.7 FIELD CONDITIONS**

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet and carpet cushion until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
- C. Do not install carpet and carpet cushion over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

**1.8 WARRANTY**

- A. Special Warranty for Carpet: Manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.
  1. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse.
  2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, excess static discharge, and delamination.
  3. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Warranty for Carpet Cushion: Manufacturer agrees to repair or replace components of carpet cushion installation that fail in materials or workmanship within specified warranty period.

1. Warranty includes consequent removal and replacement of carpet and accessories.
2. Warranty does not include deterioration or failure of carpet cushion due to unusual traffic, failure of substrate, vandalism, or abuse.
3. Failure includes, but is not limited to, permanent indentation or compression.
4. Warranty Period: 10 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 CARPET

- A. Products: Patcraft pdQ Basic Opportunity Knocks 100% solution dyed.
  1. Color/Pattern: As selected
  2. Fiber Content: 100 percent recycled nylon.
  3. Fiber Type: Solution Q Nylon.
  4. Pile Characteristic: Pattern Loop.
  5. Stitches per Inch: 12.0
  6. Guage: 1/10
  7. Width: 12 feet.
- B. Applied Soil-Resistance Treatment: Manufacturer's standard material.
- C. Antimicrobial Treatment: Manufacturer's standard material.
- D. Electrostatic Propensity: Less than 3.5 kV per AATCC 134.

### 2.2 CARPET CUSHION

- A. Products: 100% recycled synthetic fiber cushion.
  1. Wanke Cascade, Fibertouch 32.
    - a. Weight: 32 oz
    - b. Thickness: 0.30"
    - c. Traffic Class: Class II Heavy
    - d. Tensile Strength: 450 lb minimum
    - e. Tear Strength: 40 lb minimum
    - f. Pill Test: pass
    - g. Smoke Density: <450
    - h. FHA Approved: Yes
    - i. Recycled Content: 100%
    - j. Noise Reduction Coefficient (NRC): Not less than 0.35 aSAB per ASTM C 423.

### 2.3 PERFORMANCE CHARACTERISTICS

- A. Performance Characteristics: As follows:
  1. Emissions: Provide carpet and carpet cushion that complies with testing and product requirements of CRI's "Green Label" program.

2. Emissions: Provide carpet and carpet cushion that complies with the product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
3. Weight: 32

#### 2.4 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet and cushion manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and is recommended or provided by carpet and carpet cushion manufacturers.
  1. Use adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  2. Use adhesives that comply with the product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- C. Tackless Carpet Stripping: Water-resistant plywood, in strips as required to match cushion thickness and that comply with CRI 104, Section 12.2.
- D. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.
- E. Vinyl Transition Strips: Extruded vinyl of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints. Finish selected from manufacturer's standard options.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Examine carpet for type, color, pattern, and potential defects.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
  1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet cushion manufacturer.

2. Subfloor finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" for slabs receiving carpet.
  3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. For wood subfloors, verify the following:
1. Underlayment over subfloor complies with requirements specified in Division 06, Section "Sheathing."
  2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with carpet manufacturer's written installation instructions for preparing substrates.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider, and protrusions more than 1/32 inch (0.8 mm), unless more stringent requirements are required by manufacturer's written instructions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet cushion manufacturer.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet.

### 3.3 INSTALLATION

- A. Comply with CRI 104 and carpet and carpet cushion manufacturers' written installation instructions for the following:
- B. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.
- C. Do not bridge building expansion joints with carpet.
- D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.
- E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

- G. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, "Patterned Carpet Installations" and with carpet manufacturer's written recommendations.
- H. Comply with carpet cushion manufacturer's written recommendations.

#### 3.4 CLEANING AND PROTECTING

- A. Perform the following operations immediately after installing carpet:
  - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
  - 2. Remove yarns that protrude from carpet surface.
  - 3. Vacuum carpet using commercial machine with face-beater element.
- B. Protect installed carpet to comply with CRI 104, Section 16, "Protecting Indoor Installations."
- C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer and carpet cushion and adhesive manufacturers.

END OF SECTION 09 68 16

**SECTION 09 91 13 - PAINTING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes but is not limited to:

1. Surface preparation and the application of paint systems on exterior and interior substrates.
  - a. Fiber cement, siding soffits and trim.
  - b. Gypsum board.
  - c. Pre-primed metal flashing
  - d. Wood trim
  - e. Pre-primed fiberglass doors
  - f. Natural exterior components and structures.
  - g. Miscellaneous Metal fabrications (not powder coated)
  - h. Pavement marking
  - i. Pressure treated wood

- B. Related Requirements:

1. Division 07, Section "Fiber Cement Siding" for exterior painting.
2. Division 07, Section "Sheet Metal Flashing and Trim" for exterior painting.
3. Division 08, Section "Fiberglass faced Doors" for exterior painting.

**1.3 DEFINITIONS**

- A. Gloss Level 1 (Flat): Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. Gloss Level 2 (Velvet): Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523
- C. Gloss Level 3 (Egg Shell): 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- D. Gloss Level 4 (Satin): 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- E. Gloss Level 5 (Semi-Gloss): 35 to 70 units at 60 degrees, according to ASTM D 523.

- F. Gloss Level 6 (Gloss): 70 to 85 units at 60 degrees, according to ASTM D 523.
- G. Gloss Level 7 (High Gloss): More than 85 units at 60 degrees, according to ASTM D 523.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples: For each type of paint system and each color and gloss of topcoat.
  - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
  - 2. Step coats on Samples to show each coat required for system.
  - 3. Label each coat of each Sample.
  - 4. Label each Sample for location and application area.
- C. Product List: For each product indicated, include the following:
  - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
  - 2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
  - 3. VOC content.
- D. Warranty: Submit sample copy of proposed warranty stating obligations, remedies, limitations and exclusions.

#### 1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Color Schedule: Identity locations, colors, sheens and manufacturers. For inclusion in Project Record Document Manual.

#### 1.7 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

- a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).  
b. Other Items: Architect will designate items or areas required.
  2. Final approval of color selections will be based on mockups.
    - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
  3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- B. Manufacturer's Qualifications and Requirements:
1. A technical representative of paint manufacturer shall periodically observe work in progress.
  2. Technical representative shall at a minimum shall be present to observe surface preparation, general application procedures and final completion and submit documentation of manufacturer's final acceptance and warranty.
  3. Work shall not proceed until such observations have been made and conditions have been approved in writing by the manufacturer.
  4. Technical representative shall perform a punch list inspection upon substantial completion of the project indicating all items in need of attention, including conformance to manufacturer's published installation instructions and these contract documents; provide documentation.
- C. Source limitations: obtain primary products from a single manufacturer. Provide secondary products as specified or as recommended and approved by the primary manufacturer.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
1. Maintain containers in clean condition, free of foreign materials and residue.
  2. Remove rags and waste from storage areas daily.

## 1.9 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

## 1.10 WARRANTY

- A. Special Warranty: Standard form in which manufacturer agrees to replace exterior or interior paint products that fail under normal wear within specified warranty period.
1. Failures include: chipping, cracking peeling and blistering.
  2. Warranty period: 15 years.

## PART 2 - PRODUCTS

### 2.1 PRODUCTS

- A. Products: Subject to compliance with requirements, provide one of the following systems for substrates listed. Provide all coating products by same manufacturer unless otherwise noted or approved by Architect.

### 2.2 EXTERIOR PAINTING SCHEDULE

- A. Wood, Composite Wood, Fiber Cement, Exterior Gypsum Board: Latex exterior, satin/semigloss. (Including but not limited to trim, siding, panel products).
1. Prime Coat: Primer, latex for exterior.(Primer not required at pre-primed/factory primed surfaces)
    - a. Miller: Acri-Lite Primer, 1.5 mils dft.
    - b. Sherwin Williams: A100 Ext. Latex Wood Primer, 1.4 mils dft
    - c. Coronado: Crylicote Gold 100% Acrylic Primer, 1.5-2 mils dft
    - d. Benjamin Moore: Super Spec 166 100% Acrylic Busan primer, 1.2 mils dft.
  2. Finish Coats: Latex, exterior, 2 coats, satin for siding, semi-gloss for trim.
    - a. Miller: Acri-Lite, 1.5 mils dft
    - b. Sherwin Williams: Solo, A75 or Solo Int/Ext 100% Acrylic, 1.8 mils dft.
    - c. Coronado:
      - 1) Supreme Acrylic Latex House Paint 408 Line, 1.2-1.5 mils dft
      - 2) Supreme Acrylic Latex House Paint 12 Line, 1.2-1.6 mils dft
    - d. Benjamin Moore:
      - 1) Super Spec 100% Acrylic Exterior, 1.0 mil dft
      - 2) Super Spec Acrylic Latex House. 1.1 mil dft.
- B. Pre-Primed Metal, Fiberglass: Latex exterior, semi-gloss.( Including doors, metal door frames, primed downspouts, primed metal flashing, loose lintels and as noted on Drawings.)
1. Prime Coat: Pre-primed
  2. Finish Coats: Waterbased, exterior, 2 coats, semi-gloss.
    - a. Miller: Acrimet, 1.5 mils dft
    - b. Sherwin Williams: Solo Int/Ext 100% Acrylic, 1.8 mils dft.
    - c. Coronado: Corotech V331 Acrylic DTM Semi-Gloss, 2.0-2.2 mils dft.
    - d. Benjamin Moore: Super Spec HP Acrylic DTM, 1.5-2.5 mils dft.

- C. Natural Wood Site Structures: Exterior structures and natural trim as noted on Drawings.
1. Sealer/Semi-Transparent Stain: Alkyd for exterior wood, 2 coats, matte finish.
    - a. Akzo Nobel: Sikkens Cetol SRD
    - b. Penofin: Ultra Premium Penetrating Oil
    - c. Olympic: Olympic Maximum Stain
    - d. Sherwin-Williams: Woodscapes Exterior Polyurethane Semi-Transparent Stain A15T5.
    - e. Coronado: Maxum M7501 Semi Transparent Deck and Siding Oil
    - f. Benjamin Moore: Exterior Deck and Siding Stain 328
- D. Paving Marking: Chlorinated rubber-alkyd type, quick drying and non-bleeding.
1. Coronado: Super Kote 5000 Chlorinated rubber Traffic Paint G251, 6.4-8.0 mils dft.
- E. Exterior Pressure Treated Wood: Exterior pressure treated wood noted as stained.
1. Finish Coats: Waterborne Exterior Stain, 2 coats, matte finish.
    - a. Miller: Storm Category 4, Acrylic Stain. #412
    - b. Sherwin Williams: WoodScapes House Stain, Exterior Acrylic Solid Color A15 Series.
    - c. Benjamin Moore: Arborcoat, Solid Color 640.

## 2.3 INTERIOR PAINTING SCHEDULE

- A. Interior Gypsum Board: Latex, interior, eggshell.
1. Prime Coat: 1 coat.
    - a. Miller: Acri-Lite Primer, 1.5 mil dft.
    - b. Sherwin Williams: Contractors 152 Pro Primer White, B28 Series, 1.6 mils.
    - c. Coronado: Super Kote 5000 Interior Latex Primer, 1.1-1.5 mils dft.
    - d. Benjamin Moore: Super Spec 253 Latex Primer Sealer and Enamel Undercoater, 1.1 mils dft.
  2. Finish Coats: 2 coats, eggshell
    - a. Miller: Performance, 1.5 mils dft.
    - b. Sherwin Williams: ProMar 400, B20 Series, 1.3 mils dft.
    - c. Coronado: Super Kote 3000 Vinyl Acrylic Eggshell, 1.2-1.6
    - d. Benjamin Moore: Super Hide 286 Interior Eggshell, 1.0 mil dft.
- B. Interior Wood Trim: Latex, interior, satin.
1. Prime Coat: 1 coat.
    - a. Miller: Acri-Lite Primer, 1.5 mil dft
    - b. Sherwin Williams: PrepRite Multi-Purpose Primer B51W8020/B51W8023, 1.4 mils dft.
    - c. Coronado: Super Kote 5000 Acrylic Enamel Undercoat 78-11, 1.7-2.2 mils dft.
    - d. Benjamin Moore: Super Spec 253 Latex Primer Sealer and Enamel Undercoater, 1.1 mils dft.

2. Finish Coats: 2 coats, satin.
  - a. Miller: Evolution, 1.5 mils dft
  - b. Sherwin Williams: Pro Industrial Zero VOC Acrylic, B66 Series, 3.0 mils dft.
  - c. Coronado: Super Kote 3000 Vinyl Acrylic74 Line, 1.3-1.7 mils dft.
  - d. Benjamin Moore: Super Hide Interior, 1.5 mils dft

## 2.4 PAINT, GENERAL

- A. Material Compatibility:
  1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction and, for interior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  1. Flat Paints and Coatings: 50 g/L. (Including colorant added at point-of-sale: 100 g/L)
  2. Nonflat Paints and Coatings: 50 g/L.(Including colorant added at point-of-sale 100 g/L)
  3. Dry-Fog Coatings: 400 g/L.
  4. Primers, Sealers, and Undercoaters: 100 g/L.
  5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L. (Including colorant added at point-of-sale: 250 g/L)
  6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
  7. Pretreatment Wash Primers: 420 g/L.
  8. Floor Coatings: 100 g/L.
  9. Shellacs, Clear: 730 g/L.
  10. Shellacs, Pigmented: 550 g/L.
  11. Stains: 250g/L.
- C. Low-Emitting Materials: Interior paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- D. Colors: As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Concrete: 12 percent.
  - 2. Masonry (Clay and CMU): 12 percent.
  - 3. Wood: 15 percent. (including pressure treated wood)
  - 4. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.
- E. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- F. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.
- G. Pressure treated wood: Verify the moisture content is within acceptable limits.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Wood Substrates:
  - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
  - 2. Sand surfaces that will be exposed to view, and dust off.
  - 3. Prime edges, ends, faces, undersides, and backsides of wood.
  - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

5. Prepare weathered surfaces according to MPI recommended procedures until a sound surface is obtained (loose or damaged wood fibers removed).
- F. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.
- G. Substrates with Clear Coatings: Remove all construction lines, layout lines, alignment marks and notations before applying clear coatings.

### 3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
1. Use applicators and techniques suited for paint and substrate indicated.
  2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
  3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
  4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Paint the following work where exposed to view:
    - a. Equipment, including panelboards and switch gear.
    - b. Uninsulated metal piping.
    - c. Uninsulated plastic piping.
    - d. Pipe hangers and supports.
    - e. Metal conduit.
    - f. Plastic conduit.
- F. Exterior Soffits and Underside of Roof Eaves: Paint exterior soffits and the underside of roof eaves to match the trim color unless otherwise noted.

- G. Apply stains and sealers according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
- H. Vapor retarder paint, apply at the minimum dry film thickness indicated or per manufacturer's instructions to achieve a Class II perm rating of greater than 0.1 and less than or equal to 1.0, (vapor semi-impermeable). Apply at interior of exterior walls and ceilings.
- I. Dry film (dft) thicknesses indicated are per coat.
- J. Do not apply coatings to weathered surfaces.

#### 3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 09 91 13

**SECTION 10 14 00 - SIGNAGE****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes but is not limited to the following:

1. Panel signs.
2. Signage accessories.

- B. Related Requirements:

1. Division 01, Section "Temporary Facilities and Controls" for temporary Project identification signs and for temporary information and directional signs.

**1.3 DEFINITIONS**

- A. Accessible: In accordance with the accessibility standard.
- B. Illuminated: Illuminated by lighting source integrally constructed as part of the sign unit.

**1.4 COORDINATION**

- A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.
- B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

**1.5 SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.
- B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.

1. Provide message list for each sign, including large-scale details of wording, lettering, artwork, and braille layout.
  2. Include fabrication and installation details and attachments to other work.
  3. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
- C. Samples: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:
1. Dimensional Characters: Full-size Samples of each type of dimensional character (letter, number, and graphic element).
  2. Aluminum: For each form, finish, and color, on 6-inch- long sections of extrusions and squares of sheet at least 4 by 4 inches.
  3. Panel Signs: Not less than 12 inches square including border.
  4. Accessories: Manufacturer's full-size unit.
- D. Sign Schedule: Use same designations indicated on Drawings.
- E. Qualification Data: For Installer and fabricator.
- F. Maintenance Data: For signs to include in maintenance manuals.
- G. Warranty: Special warranty specified in this Section.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative of signage manufacturer for installation and maintenance of units required for this Project.
- B. Source Limitations: Obtain each sign type through one source from a single manufacturer.
- C. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

#### 1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Verify recess openings by field measurements before fabrication and indicate measurements on Shop Drawings.

#### 1.8 COORDINATION

- A. Coordinate placement of anchorage devices with templates for installing signs.

## 1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Deterioration of metal and polymer finishes beyond normal weathering.
    - b. Deterioration of embedded graphic image colors and sign lamination.
  - 2. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- B. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities, Fair Housing Act, Oregon Structural Specialty Code and ICC A117.1 for signs.

### 2.2 PARKING SIGNS

- A. Material: 0.080-inch aluminum or other noncorrosive material.
- B. Background and Copy Material: Reflective vinyl.
- C. Mounting: Post mounted, galvanized steel post.

### 2.3 PANEL SIGNS - INTERIOR

- A. Manufacturers:
  - 1. Best Manufacturing
  - 2. ASI Sign Systems.
- B. Plastic Laminate: Provide high-pressure laminate engraving stock with face and core plies as selected by Architect from manufacturer's full range.
- C. Laminated Panels: Permanently laminate face panels to backing sheets of material; use manufacturer's standard process.

- D. Fabricate signs with edges mechanically and smoothly finished to comply with the following requirements:
1. Edge Condition: Square cut.
  2. Corner Condition: Square.
- E. Graphic Content and Style: Provide sign copy that complies with requirements indicated for size, style, spacing, content, mounting height and location, material, finishes, and colors of signage.
1. Graphic content to be selected by Architect from manufacturer's standards after Award of Contract.
  2. Rooms required to be identified with panel signs are indicated in Sign Schedule at the end of this Section.
- F. Tactile and Braille Copy: Manufacturer's standard process for producing copy complying with ADA Accessibility Guidelines and ICC/ANSI A117.1. Text shall be accompanied by Grade 2 braille. Produce precisely formed characters with square cut edges free from burrs and cut marks.
- G. Engraved Copy: Machine engrave letters, numbers, symbols, and other graphic devices into panel sign on face indicated to produce precisely formed copy, incised to uniform depth. Engrave through exposed face ply of plastic-laminate sheet to expose contrasting core ply.

#### 2.4 PROJECT SIGN

- A. MDO Plywood: 4 feet x 8 feet, painted or cut vinyl. Layout as directed by Architect.

#### 2.5 ACCESSORIES

- A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

#### 2.6 FABRICATION

- A. General: Provide manufacturer's standard signs of configurations indicated.
1. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
  2. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
  3. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.

## 2.7 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts, provided under other sections of Work are sized and located to accommodate signs.
- C. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
  1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
  2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable, with bottom edge at 52 inches above finished floor. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
  1. Two-Face Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
  2. Hook-and-Loop Tapes: Mount signs to smooth, nonporous surfaces.
  3. Magnetic Tape: Mount signs to smooth, nonporous surfaces.

4. Silicone-Adhesive Mounting: Attach signs to irregular, porous, or vinyl-covered surfaces.
  5. Shim Plate Mounting: Provide 1/8-inch- thick, concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other mounting methods are not practicable. Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach panel signs to plate using method specified above.
  6. Mechanical Fasteners: Use nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.
  7. Signs Mounted on Glass: Provide matching opaque plate on opposite side of glass to conceal mounting materials.
- C. Bracket-Mounted Signs: Provide manufacturer's standard brackets, fittings, and hardware for mounting signs that project at right angles from walls and ceilings. Attach brackets and fittings securely to walls and ceilings with concealed fasteners and anchoring devices to comply with manufacturer's written instructions.
- D. Face Mounting: Mount plaques using exposed fasteners with rosettes attached through
- E. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches of sign without encountering protruding objects or standing within swing of door.
- F. Wall-Mounted Panel Signs: Attach panel signs to wall surfaces using nonremovable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

### 3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

### 3.4 SIGN SCHEDULE

- A. Provide signs identifying the following:
1. Fire Riser Rooms.
  2. Unit numbers.
  3. Building identification.
  4. Accessible parking spaces.
  5. Project name and address.

END OF SECTION 10 14 00

**SECTION 10 28 00 – TOILET AND BATH ACCESSORIES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Toilet and bath accessories.
2. Underlavatory guards.
3. Grab bars
4. Mirrors

**1.3 SUBMITTALS**

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

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Features that will be included for Project.
5. Manufacturer's warranty.

- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify products using designations indicated.

- C. Warranty: Sample of special warranty.

**1.4 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

**1.5 QUALITY ASSURANCE**

- A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

#### 1.6 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

#### 1.7 WARRANTY

- A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: 15 years from date of Substantial Completion.
- B. Toilet Accessories Warranty Period: One (1) year limited warranty commencing on the date of substantial completion.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.
- B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.
- D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.
- E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

## 2.2 FASTENERS

- A. Fabricated hollow wall anchor appropriately sized to meet ADA and all code required load requirements of attached item and substrate.

1. WingIt Fastener; WingIt Innovations LLC, 877-894-6448

## 2.3 TOILET AND BATH ACCESSORIES

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

1. Basco, Inc.
2. Bobrick Washroom Equipment, Inc.
3. Bradley Corporation.

## 2.4 UNDERLAVATORY GUARDS

- A. Underlavatory Guard:

1. Description: Molded rigid insulating pipe covering for supply and drain piping assemblies that prevent direct contact with and burns from piping; allow service access without removing coverings.
2. Material and Finish: Antimicrobial, molded plastic, white.

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

1. IPS, Inc.; TruBro.
2. Plumberex Inc.; Pro-Extreme.

## 2.5 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for direct mount anchorage and with corrosion-resistant backing plates.
- B. Recessed Toilet Accessories: Unless otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors and access panels with full-length, stainless-steel hinge. Provide anchorage that is fully concealed when unit is closed.
- C. Framed Glass-Mirror Units: Fabricate frames for glass-mirror units to accommodate glass edge protection material. Provide mirror backing and support system that permits rigid, tamper-resistant glass installation and prevents moisture accumulation.
1. Provide galvanized steel backing sheet, not less than 0.034 inch and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.

- D. Mirror-Unit Hangers: Provide mirror-unit mounting system that permits rigid, tamper- and theft-resistant installation.:

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

#### 3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

#### 3.3 TOILET AND BATH ACCESSORIES SCHEDULE

##### A. APARTMENTS:

1.	Toilet Paper Holder:	Basco #5115	Surface mounted chrome roller.
2.	Towel Bars	Basco, #5518, 5524, 5530	As shown on Drawings.
3.	Shower Curtain Rod:	Basco #1212	Polished stainless steel
4.	Shower Rod Flanges:	Basco #1204B	Stainless steel, exposed screw
5.	Mirrors:	Frameless mirrored glass	Size as shown on Drawings.

##### B. ACCESSIBLE APARTMENT

1.	Toilet Paper Holder:	Basco #5115	Surface mounted chrome roller.
2.	Towel Bars	Basco, #5518, 5524, 5530	As shown on Drawings.
3.	Shower Curtain Rod:	Basco #1212	Polished stainless steel
4.	Shower Rod Flanges:	Basco #1204B	Stainless steel, exposed screw
5.	Mirrors:	Frameless mirrored glass	Size as shown on Drawings.
6.	Under Lav. Guard:	Truebro, Lav-Guard	
7.	Grab Bars:	Bobrick #5806 series	As shown on Drawings.

END OF SECTION 10 28 00

**SECTION 10 55 00 - POSTAL SPECIALTIES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:
  - 1. Existing postal cluster boxes.

**PART 2 - PRODUCTS****2.1 CLUSTER BOX UNITS**

- A. Existing to remain.

**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Protect existing postal boxes from damage during construction.
- B. Examine substrates, areas, conditions and verify clearances, and other conditions affecting performance of the Work.
- C. Examine finishes and condition of boxes before reuse. Repair any finish or box damage.

**3.2 INSTALLATION**

- A. Final acceptance of postal specialties served by USPS depends on compliance with USPS requirements
- B. Verify reach clearances at boxes:
  - 1. Vertical Mail Receptacles: Verify installation of vertical mail receptacles with center of master lock cylinder not more than 48 inches (1219 mm) and not less than 30 inches (762 mm) above finished floor.
  - 2. Collection Boxes: Verify installation of collection boxes with centerline of mail slots and not more than 48 inches (1219 mm) above finished floor.

3. Receiving Boxes: Verify installation of receiving boxes with bottom of unloading door not less than 30 inches (762 mm) above finished floor.
4. Verify installation of receiving boxes with exterior of box bottom not more than 20 inches (508 mm) above finished floor

### 3.3 FIELD QUALITY CONTROL

- A. Arrange for USPS personnel to examine and test postal specialties served by USPS after they have been installed according to USPS regulations.
- B. Obtain written final approval of postal specialties to be served by USPS. Obtain this approval from USPS postmaster that authorizes mail collection for the served installation.

### 3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Remove temporary protective coverings.
- B. Adjust doors, hardware, and moving parts to function smoothly, and lubricate as recommended by manufacturer. Verify that integral locking devices operate properly.
- C. Touch up marred finishes or replace postal specialties that cannot be restored to satisfactory appearance. Use only materials and procedures recommended or furnished by postal specialty manufacturer.
- D. Replace postal specialties that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.
- E. On completion of postal specialty installation, clean interior and exterior surfaces.

END OF SECTION 10 55 00

**SECTION 11 31 00 - RESIDENTIAL APPLIANCES****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

1. Cooking appliances.
2. Kitchen exhaust ventilation.
3. Refrigeration appliances.
4. Cleaning appliances.
5. Unit laundry appliances.

- B. Related Sections:

1. Division 12, Section "Residential Casework" cabinetry adjacent to appliances.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, dimensions, furnished accessories, and finishes for each appliance.
- B. Product Schedule: For appliances. Use same designations indicated on Drawings.
- C. Product Certificates: For each type of appliance, from manufacturer.
- D. Warranties: Sample of special warranties.
- E. Energy Star: Provide product data indicating Energy Star rating
- F. Accessible Appliances: Provide product data indicating compliance with applicable ADA requirements.
- G. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

**1.4 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Maintains, within 50 miles of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

- B. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.
- C. Source Limitations: Obtain residential appliances from single source and each type of residential appliance from single manufacturer.
- D. Regulatory Requirements: Comply with the following:
  - 1. NFPA: Provide electrical appliances listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  - 2. ANSI: Provide gas-burning appliances that comply with ANSI Z21 Series standards.
- E. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1 and the Fair Housing Act.

#### 1.5 WARRANTY

- A. Special Warranties: Manufacturer's standard form in which manufacturer agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: One year from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 APARTMENT APPLIANCES, ACCESSIBLE UNITS

- A. Range: GE JD900WK, 30" drop-in electric range. ADA, Color: white with white cooktop.
- B. Range Hood: Broan 423001, two speed, standard range hood. Color: white. With Broan 68W, ADA wall switch. Color: white.
- C. Refrigerator: GE GTH181BDWW, Energy Star, ADA 18.0 cu. Ft. capacity, top freezer. Color: white. Verify door swing with kitchen plan.
- D. Dishwasher: GE GLDT69ODWW, Energy Star, ADA, built-in dishwasher for 34 inch high counters. Color: white.
- E. Washer: GE GFWH1200DWW, Energy Star, ADA, 3.6 cu ft. Color: White
- F. Dryer: GE GFDN110EDWW, 7.0 cu ft. Color: White.

#### 2.2 GENERAL FINISH REQUIREMENTS

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

- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.
- C. Examine walls, ceilings, and roofs for suitable conditions where overhead exhaust hoods will be installed.
- D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Range Anti-Tip Device: Install at each range according to manufacturer's written instructions.
- E. Provide switch at counter top level to control range hood fans.
- F. Provide appliances with all power cords and connections required for complete installation.
- G. Utilities: Comply with plumbing and electrical requirements.

### 3.3 FIELD QUALITY CONTROL

- A. Tests and Inspections:

1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
  2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
  3. Operational Test: After installation, start units to confirm proper operation.
  4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

#### 3.4 DEMONSTRATION

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

END OF SECTION 11 31 00

**SECTION 12 21 13 - HORIZONTAL LOUVER BLINDS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes but is not limited to:

- 1. Horizontal louver blinds with PVC slats.

- B. Related Requirements:

- 1. Division 06, Section "Rough Carpentry" for wood blocking and grounds for mounting horizontal louver blinds and accessories.

**1.3 SUBMITTALS**

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

- B. Samples: For each type and color of horizontal louver blind indicated.

- 1. Slat: Not less than 12 inches (300 mm) long.
  - 2. Valance: Full-size unit, not less than 12 inches (300 mm) wide.

- C. Window-Treatment Schedule: For horizontal louver blinds. Use same designations indicated on Drawings.

**1.4 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For horizontal louver blinds to include in maintenance manuals.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver horizontal louver blinds in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

## 1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not install horizontal louver blinds until construction and wet and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain horizontal louver blinds from single source from single manufacturer.

### 2.2 HORIZONTAL LOUVER BLINDS, ALUMINUM SLATS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Hunter Douglas Contract.
  - 2. Levolor Contract; a Newell Rubbermaid company.
- B. Slats: PVC, recommended by producer for type of use and finish indicated; with crowned profile and radius corners.
  - 1. Width: 1 inch (25 mm).
  - 2. Thickness: Manufacturer's standard.
  - 3. Spacing: Manufacturer's standard.
- C. Headrail: Headrails fully enclose operating mechanisms on three sides.
  - 1. Ends: Capped or plugged.
  - 2. Manual Lift Mechanism:
    - a. Lift-Cord Lock: Top locking; stops lift cord when blind is in fully opened or fully closed positions only; equipped with ring pull not more than 4 inches (100 mm) long.
    - b. Operator: Extension of lift cord(s) through lift-cord lock mechanism to form cord pull.
  - 3. Manual Tilt Mechanism: Enclosed worm-gear mechanism and linkage rod that adjusts ladders.

- a. Tilt: Full.
  - b. Operator: Clear-plastic wand.
  - c. Over-Rotation Protection: Manufacturer's detachable operator or slip clutch to prevent over rotation of gear.
4. Manual Lift-Operator and Tilt-Operator Lengths: Full length of blind when blind is fully closed Length required to extend to 48 inches (1219 mm) above floor level when blind is fully closed.
- D. Bottom Rail: Tube that secures and protects ends of ladders and lift cords and has plastic- or metal-capped ends.
1. Type: Manufacturer's standard.
- E. Lift Cords: Manufacturer's standard braided cord.
- F. Ladders: Evenly spaced across headrail at spacing that prevents long-term slat sag.
- G. Valance: Manufacturer's standard.
- H. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.
1. Type: Overhead.
  2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.
- I. Hold-Down Brackets and Hooks or Pins: Manufacturer's standard.
- J. Colors, Textures, Patterns, and Gloss:
1. Slats: As selected by Architect from manufacturer's full range.
  2. Components: Provide rails, cords, ladders, and materials exposed to view matching or coordinating with slat color unless otherwise indicated.

### 2.3 HORIZONTAL LOUVER BLIND FABRICATION

- A. Product Safety Standard: Fabricate horizontal louver blinds to comply with WCMA A 100.1 including requirements for corded, flexible, looped devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch (6 mm) per side or 1/2 inch (13 mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill dimension of opening in which blind is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).
  2. Outside of Jamb Installation: Width and length as indicated, with terminations between blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

- C. Concealed Components: Noncorroding or corrosion-resistant-coated materials.
  - 1. Lift-and-Tilt Mechanisms: With permanently lubricated moving parts.
- D. Mounting and Intermediate Brackets: Designed for removal and reinstallation of blind without damaging blind and adjacent surfaces, for supporting blind components, and for bracket positions and blind placement indicated.
- E. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Install horizontal louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
  - 1. Locate so exterior slat edges are not closer than 1 inch (25 mm) from interior faces of glass and not closer than 1/2 inch (13 mm) from interior faces of glazing frames through full operating ranges of blinds.
  - 2. Install mounting and intermediate brackets to prevent deflection of headrails.
  - 3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

- B. Electrical Connections: Connect motorized operators to building electrical system.

#### 3.3 ADJUSTING

- A. Adjust horizontal louver blinds to operate free of binding or malfunction through full operating ranges.

#### 3.4 CLEANING AND PROTECTION

- A. Clean horizontal louver blind surfaces after installation according to manufacturer's written instructions.

- B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer and that ensures that horizontal louver blinds are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged horizontal louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

### 3.5 DEMONSTRATION

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

END OF SECTION 12 21 13

**SECTION 12 35 30 - RESIDENTIAL CASEWORK and COUNTERTOPS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section includes but is not limited to:

1. Kitchen and vanity cabinets.
2. Plastic laminate countertop and backsplashes.

- B. Related Requirements:

1. Division 11, Section "Residential Appliances"

**1.3 DEFINITIONS**

- A. MDF: Medium-density fiberboard.
- B. Exposed Surfaces of Cabinets: Surfaces visible when doors and drawers are closed, including visible surfaces in open cabinets or behind glass doors.
- C. Semiexposed Surfaces of Cabinets: Surfaces behind opaque doors or drawer fronts, including interior faces of doors, interiors and sides of drawers, and bottoms of wall cabinets.
- D. Concealed Surfaces of Cabinets: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, ends of cabinets installed directly against and completely concealed by walls or other cabinets, and tops of wall cabinets and utility cabinets.

**1.4 SUBMITTALS**

- A. Product Data: For the following:

1. Cabinets.
2. Cabinet hardware.
3. Plastic-laminate countertops.

- B. Shop Drawings:

1. Cabinets: Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, and hardware.
  2. Countertops: Show locations and sizes of cutouts and holes for plumbing fixtures faucets and other items installed in plastic-laminate countertops.
- C. Samples for Verification: 8-by-10-inch (200-by-250-mm) Samples for each type of finish and the following:
1. Exposed hardware and hinges, for each type of item.
  2. One full-size, 16 inches (406 mm) wide, finished base cabinet complete with hardware, doors, and drawers but without countertop. Sample will be returned to Contractor for use on Project.
  3. Plastic laminate for countertops. 8 by 10 inches.
- D. Qualification Data: For manufacturer.
- E. Product Certificates: For casework.

## 1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in KCMA's Quality Certification Program.

## 1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet work is complete and dry, and temporary HVAC system is operating and maintaining temperature and humidity conditions at occupancy levels during the remainder of the construction period.
- B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Provide fillers and scribes to allow for trimming and fitting.
- C. Field Measurements: Where casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.
- D. Clearances:
1. Field measure existing conditions and verify cabinet dimensions will allow drawers and doors to operate correctly without interference from adjacent cabinet and appliances. Adjust cabinet dimensions as required to achieve correct fit.
  2. Verify that installed cabinets and countertops will allow required maneuvering clearances as required by Fair Housing Act, UFAS and ADA requirements.

#### 1.7 COORDINATION

- A. Coordinate layout and installation of blocking and reinforcement in partitions for support of casework.
- B. Coordinate locations of utilites that will penetrate countertops or backsplashes.

#### 1.8 WARRANTY

- A. Counter Top Warranty Period: One (1) year limited warranty commencing on the date of substantial completion.
- B. Cabinet Warranty Period: One (1) year limited warranty commencing on the date of substantial completion.

### PART 2 - PRODUCTS

#### 2.1 CABINETS

- A. Products: Subject to compliance with requirements.
  - 1. Lanz, Eugene;
  - 2. Smart Cabinets
  - 3. Borror Cabinets, Klamath Falls.
- B. Quality Standard: Provide cabinets that comply with KCMA A161.1.
  - 1. KCMA Certification: Provide cabinets with KCMA's "Certified Cabinet" seal affixed in a semiexposed location of each unit and showing compliance with the above standard.
- C. Face Style: Reveal overlay; door and drawer faces partially cover cabinet fronts.
- D. Cabinet Style: Face frame.
- E. Door and Drawer Fronts: Solid-wood stiles and rails, 3/4 inch (19 mm) thick, with 1/4-inch-(6.4-mm-) thick, veneer-faced plywood center panels.
- F. Drawer Sides: 1/2" thick, veneer-faced plywood.
- G. Drawer Bottom, 1/4" thick, veneer faced plywood, kerfed into drawer sides.
- H. Face Frames: 3/4-by-1-5/8-inch (19-by-41-mm) solid wood.
- I. Exposed Cabinet End Finish: Wood veneer.
- J. Cabinet End Construction: 1/2-inch- (12.7-mm-) thick plywood.
- K. Cabinet Tops and Bottoms: 1/2-inch- (12.7-mm-) thick plywood, fully supported by and secured in rabbets in end panels, front frame, and back rail.

- L. Sink and Lavatory Sides and Bases: Waterproof plywood.
- M. Back, Top, and Bottom Rails: 3/4-by-2-1/2-inch (19-by-63-mm) solid wood, interlocking with end panels and rabbeted to receive top and bottom panels. Back rails secured under pressure with glue and with mechanical fasteners.
- N. Wall-Hung-Unit Back Panels: 3/16-inch- (4.8-mm-) thick plywood fastened to rear edge of end panels and to top and bottom rails.
- O. Base-Unit Back Panels: 1/8-inch- (3.2-mm-) thick hardboard fastened to rear edge of end panels and to top and bottom rails.
- P. Front Frame Drawer Rails: 3/4-by-1-1/4-inch (19-by-32-mm) solid wood mortised and fastened into face frame.
- Q. Drawers: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
- R. Shelves: 3/4-inch- (19-mm-) thick particleboard or plywood with solid wood edgebanding.
- S. Joinery: Rabbet backs flush into end panels and secure with concealed mechanical fasteners. Connect tops and bottoms of wall cabinets and bottoms and stretchers of base cabinets to ends and dividers with mechanical fasteners. Rabbet tops, bottoms, and backs into end panels.
- T. Factory Finishing: Finish cabinets at factory. Defer only final touchup until after installation.

## 2.2 CABINET MATERIALS

- A. General:
  - 1. Adhesives and Composite Wood and Agrifiber Products: Do not use products that contain urea formaldehyde.
  - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
  - 3. Composite Wood and Agrifiber Products: Products shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
  - 4. Hardwood Lumber: Kiln dried to 7 percent moisture content.
  - 5. Softwood Lumber: Kiln dried to 10 percent moisture content.
  - 6. Hardwood Plywood: HPVA HP-1; made with adhesive containing no urea formaldehyde.
  - 7. Particleboard: ANSI A208.1, Grade M-2; made with binder containing no urea formaldehyde. Recycled Content: Preconsumer or postconsumer recycled content not less than 100 percent. "SkyBlend" (roseburg.com)
  - 8. MDF: ANSI A208.2, Grade MD; made with binder containing no urea formaldehyde. Recycled Content: Preconsumer or postconsumer recycled content not less than 100 percent.

9. Hardboard: ANSI A135.4, Class 1 Tempered. Recycled Content: Preconsumer or postconsumer recycled content not less than 100 percent.

B. Exposed Materials:

1. Exposed Wood Species: Alder, Stain – Teakwood.
  - a. Select materials for compatible color and grain. Do not use two adjacent exposed surfaces that are noticeably dissimilar in color, grain, figure, or natural character markings.
  - b. Staining and Finish: As selected by Architect from manufacturer's full range.
2. Solid Wood: Clear hardwood lumber of species indicated, free of defects.
3. Plywood: Hardwood plywood with face veneer of species indicated, with Grade A faces and Grade C backs of same species as faces.
  - a. Edge band exposed edges with a minimum of 1/8-inch- (3-mm-) thick, solid-wood edging of same species as face veneer.

C. Semiexposed Materials: Unless otherwise indicated, provide the following:

1. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper.
  - a. Provide material finished on both sides for shelves, dividers, drawer bodies, and other components with two semiexposed surfaces.
  - b. Provide waterproof materials at areas subject to moisture intrusion, (Sink and lavatory bases)
  - c. Provide PVC or polyester edgebanding on components with semiexposed edges.
  - d. Colors: As selected by Architect from cabinet manufacturer's full range.
- D. Concealed Materials: Solid wood or plywood, of any hardwood or softwood species, with no defects affecting strength or utility; particleboard; MDF; or hardboard.

### 2.3 CABINET HARDWARE

- A. General: Manufacturer's standard units complying with BHMA A156.9, Grade 1 of type, size, style, material, and finish as selected by Architect from manufacturer's full range.
- B. Pulls: Wire pulls, 3 ½" metal, finish as selected from manufacturer's standard range.
- C. Hinges: Concealed European-style, self-closing hinges.
- D. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05011 or Type B05091.
  1. Full extension with 100 pound rating.

## 2.4 PLASTIC LAMINATE COUNTERTOPS

- A. Quality Standard: Unless otherwise indicated, comply with KCMA A161.2.
- B. Grade: Premium.
- C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS.
- D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
  - 1. As selected by Architect from manufacturer's full range in the following categories:
- E. Edge Treatment: Same as laminate cladding on horizontal surfaces or as indicated.
- F. Core Material: Particleboard made with exterior glue or Medium-density fiberboard made with exterior glue.
  - 1. "Skyblend" particle board, (Roseburg.com).
- G. Core Thickness: 3/4 inch (19 mm).
  - 1. Build up countertop thickness to 1-1/2 inches (38 mm) at front, back, and ends with additional layers of core material laminated to top.
- H. Fabricate countertops with integral backsplash and rolled self-edge.
- I. Paper backing: Provide paper backing on underside of countertop substrate. Paper backing to completely cover underside of countertop substrate including underside of exposed edge.

## 2.5 COUNTERTOP FABRICATION

- A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch (25 mm) over base cabinets. Ease edges to radius indicated for the following:
  - 1. Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.
- B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
  - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
  - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- C. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in

diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

1. Seal edges of openings in countertops with a coat of varnish.

## PART 3 - EXECUTION

### 3.1 CABINET EXAMINATION

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

### 3.2 CABINET INSTALLATION

- A. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.
- B. Install cabinets without distortion so doors and drawers fit the openings, are aligned, and are uniformly spaced. Complete installation of hardware and accessories as indicated.
- C. Install cabinet's level and plumb to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m).
- D. Fasten cabinets to adjacent units and to backing.
  1. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips or toggle bolts through the metal backing or metal framing behind the wall finish.
- E. Fasten plastic-laminate countertops by screwing through corner blocks of base units into underside of countertop. Form seams using splines to align adjacent surfaces, and secure with waterproof glue and concealed devices designed for this purpose.
  1. Provide cutouts for sinks and lavatories, including holes for faucets and accessories.
  2. Seal edges of cutouts by saturating with varnish.
  3. Provide paper backing on underside of countertop.

### 3.3 CABINET ADJUSTING AND CLEANING

- A. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.
- B. Clean casework on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

### 3.4 COUNTERTOP PREPARATION

- A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.
- B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

### 3.5 COUNTERTOP INSTALLATION

- A. Grade: Install countertops to comply with same grade as item to be installed.
- B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
  1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.
  2. Seal edges of cutouts by saturating with varnish.
- C. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
  1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
- D. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- E. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
  1. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
  2. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

### 3.6 COUNTERTOP ADJUSTING AND CLEANING

- A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

- B. Clean countertops on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 12 35 30

**SECTION 21 0001 - BASIC FIRE SUPPRESSION REQUIREMENTS - DESIGN BUILD****PART 1 GENERAL****1.1 DESCRIPTION OF WORK**

- A. This Section specifies the basic requirements for all Contractor design and installed equipment. It applies to all sections included in Division 21.
- B. Contractor shall provide complete engineering calculations and design of the fire protection system satisfying the direction and criteria of this specification and all other supporting documents and drawings.
- C. Provide the design and all materials, labor and equipment required to install a complete and fully operational fire protection system as indicated by the contract drawings and this specification. Provide new NFLA 13R sprinkler system(s) at all 3-story living structures.
- D. Contractor shall be responsible for becoming familiar with existing conditions prior to the bid and include any and all costs associated with the modification, extension or addition to existing systems in order to meet the requirements of these documents.
- E. Contractor shall not compromise or diminish any existing building system, service or function in his execution of the work. Any such potential impacts shall be immediately brought to the attention of the Architect/Engineer.
- F. Obtain and pay for all permits, licenses, fees and taxes applicable to this project as required by law.
- G. Cooperate with other trades in furnishing material and information required for installation and operation of mechanical items.
- H. Requirements for the following are included:
  - 1. Related work (other Contract Documents and specification sections) that must be combined with the requirements of this Section.
  - 2. Design performance.
  - 3. Delivery, storage, and handling.
  - 4. Quality assurance and standards.
  - 5. Submittals.
  - 6. Product quality, basic type, and finishes.
  - 7. Equipment identification.
  - 8. Design criteria.
  - 9. Excavation and backfill.

10. Installation.
11. Mounting and shimming.
12. Inspection.
13. Safety considerations.
14. Cleaning, startup, and adjustments.

## 1.2 RELATED WORK

- A. This general section shall be used in conjunction with the following other specifications and related Contract Documents to establish the total requirements for the project equipment and systems:
1. Division 1 sections included in this Project specifications.
  2. The Contract.
  3. General and specific mechanical specifications and drawings included in the project.

## 1.3 DEFINITIONS

- A. “Indicated”: Refers to graphic representations, notes or schedules in the Drawings; or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents.
1. Terms such as “shown”, “noted”, “scheduled”, and “specified”, are used to notify or help the user to locate reference. Location is not limited.
- B. “Directed”: Terms such as “directed”, Requested”, “authorized”, “selected”, “approved”, “required”, and “permitted” mean directed by Architect/Engineer, approved by Architect/Engineer and similar phrases.
- C. “Approved”: When used in conjunction with Architect/Engineer's action on contract submittals, applications, requests, is limited to Architect/Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- D. “Regulations”: Includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of Work.
- E. “Furnish”: Means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation and similar operations.
- F. “Install”: Describes operations at Project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, supporting, isolating,

applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.

- G. "Provide": Means to furnish and install.
- H. "Installer": A contractor, or another entity engaged by the contractor, either as an employee, subcontractor, or contractor of a lower tier, to perform a particular construction activity including installation, erection, application or similar operations.
  - 1. Installers are required to be experienced in operations they are engaged to perform.
  - 2. The term "experience" means having successfully completed a minimum of three previous projects similar in scope and size to this Project and within the time frame indicated in the "Quality Assurance" section of the Specifications. In addition, it means being familiar with special requirements indicated and having complied with requirements of authorities having jurisdiction.
- I. "Project Site": Is defined as the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project.

#### 1.4 DESIGN PERFORMANCE

- A. Compliance by the Contractor and/or Vendor with the provisions of this Specification does not relieve him of the responsibilities of furnishing equipment and materials of proper design, mechanically suited to meet operating guarantees at the specified service conditions.

#### 1.5 SUBMITTALS

- A. Product Data: Submit five complete sets of manufacturer's product data in a three ring binder for approval. Literature submitted shall clearly indicate the model number, capacity, rated operating conditions, size, weight, support requirements, electrical power requirements, utility (fuel, air, cooling water, etc.) requirements, and options furnished. Submittals shall include, but are not necessarily limited to the following:
  - 1. Fire Protection: Piping materials; valves; fittings; supports; switches; alarms; backflow devices; sprinkler heads; compressors; fire pumps and the like. Provide minimum 36 x 24 size system layout shop drawings. Provide hydraulic calculations.
  - 2. Calculations: Provide for sizing of all utility services, including fire sprinkler main and all building piping; pumps head and flow sizing for all systems; thermal expansion and seismic restraints; and all other calculations and all other calculations consistent with good engineering practice. Include design criteria used and assumptions made.

- B. Operation and Maintenance Data: Submit three complete sets of manufacturer's literature bound in a three ring binder for approval. Data shall include installation, start-up, and maintenance instructions, parts lists, and wiring diagrams.
- C. Substitutions: System design was based upon the equipment and materials listed on the drawings and specifications herein. At contractor's option, another manufacturer's equipment of similar quality, capacity and features may be submitted for prior approval per Section 01 3300. Prior permission to substitute does not relieve the contractor of the responsibility of including this information in the bound submittal packages.

## 1.6 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the provisions of the latest versions of the following codes, standards and specifications, except where more stringent requirements are shown or specified:
  1. State of Oregon "IBC".
  2. State of Oregon "IMC".
  3. State of Oregon "UPC".
  4. State of Oregon "IFC".
  5. NFPA 13/13R.
- B. Drawings: Any drawings provided are diagrammatic and show general intent, arrangement, and extent of the systems. Do not scale drawings for rough-in dimensions, nor use as shop drawings.
- C. Installer Qualifications: Company specializing in performing the work required with a minimum of five years documented experience.

## 1.7 DELIVERY, STORAGE AND PROTECTION

- A. Delivery: Deliver to site with manufacturer's labels intact and legible.
- B. Preparation for shipment:
  1. Each unit shall be suitably prepared for the shipment specified and for storage in accordance with manufacturer's instructions in a manner requiring no disassembly prior to operation.
  2. The Contractor shall be solely responsible for the adequacy of the Preparation for Shipment provisions employed with respect to materials and application.
  3. One complete set of Installations, Operating and Maintenance Instructions shall be packed and shipped with the equipment. This set is in addition to the sets that are to be sent directly to the Owner.

- C. Handling: Avoid damage. Comply with manufacturer's installation instruction requirements for rigging, unloading and transporting units.
- D. Storage: Inside protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping. Cap all pipe ends. Taping pipe ends is not adequate or allowable.

## 1.8 PROJECT CONDITIONS

- A. General: Provide products that are compatible with other portions of the work and provide products with the proper power characteristics and similar adaptations for the project.
- B. Arrangement: Arrange piping parallel with primary lines of the building construction and with a minimum 7 feet overhead clearance in unfinished equipment rooms where possible. Conceal all piping where possible unless indicated otherwise. Locate operating and control equipment properly to provide easy access for operation and maintenance. Give right-of-way to piping which must be sloped for drainage. Set all equipment level or as recommended by manufacturer.
- C. Coordination: Where several elements of the work must be sequenced and positioned in order to fit the available space, prepare shop drawings showing the actual physical dimensions (at accurate scale) required for installation and submit prior to purchase/fabrication/installation of any of the elements involved in the coordination.

## 1.9 STANDARDS

- A. General: Provide all new materials and equipment, identical to apparatus or equipment in successful operation for a minimum of five years. Provide materials of comparable quality omitted here but necessary to complete the work. Maximum allowable variation from stated capacities, minus 5% to plus 10% as approved in each case.
- B. Governing Standards: The following are typical standards generally referenced in these specifications and identified by their acronym. Factory Mutual (FM), Federal Specifications (FS), American Society for Testing Materials (ASTM), American National Standards Institute (ANSI), Manufacturer's Standardization Society of the Valve and Fitting Industry, Standard Practice (MSS SP-69), Underwriters Laboratory (UL) numbers are given.

## 1.10 WARRANTIES

- A. Contractor shall provide a 1-year warranty on all equipment, materials and workmanship for a period of one year from the date of owner's acceptance.

## PART 2 PRODUCTS (NOT USED)

## PART 3 EXECUTION

### 3.1 LAYOUT AND COORDINATION

- A. Site Examination: Before starting work, carefully examine site and all Contract Drawings. Become thoroughly familiar with conditions governing work on this project. Verify all indicated elevations, building measurements, rough-in dimensions and equipment locations before proceeding with any work.
- B. Utility Locations: All on-site utilities to be new. See civil documents.
- C. Discrepancies: Any error, conflict or discrepancy in Specifications and/or existing conditions shall be reported immediately. Do not proceed with any questionable items of work until clarification of same has been made. Under no circumstances shall beams, girders, footings, or columns be cut for mechanical items. Casting of pipes into concrete is prohibited.

### 3.2 DESIGN CRITERIA

- A. Fire Suppression:
  1. In accordance with NFPA 13.

### 3.3 EXCAVATION AND BACKFILL

- A. General: Perform all necessary excavation and backfill required for the installation of mechanical work. Any piping or other work damaged by the Contractor's operations shall be repaired at the Contractor's expense.
- B. Water: Keep all excavations free of standing water. Excavations damaged or softened by water or frost shall be re-excavated and filled back to original level with approved material at the Contractor's expense.
- C. Test: During the progress of the work for compacted fill, the Owner reserves the right to request compaction tests made under the direction of a testing laboratory.
- D. Trench Excavation: Excavate trenches to the necessary depth and width, removing rocks, unstable soil (silt, peat, etc.) roots and stumps. Width of trench shall be adequate for proper installation of piping or conduit.

- E. Foundation and Bedding:
1. Proper preparation of foundation, placement of foundation material where required, and placement of bedding material shall precede the installation of the pipe. This shall include leveling of the trench bottom as well as placement and compaction of required bedding material to a uniform grade so that piping rests upon continuous and uniform bedding.
  2. Where excavation has been made below the required grade, the Contractor shall provide, place and compact suitable bedding material to restore the proper grade elevation.
- F. Backfilling: Upon acceptance of installed piping systems, trenches shall be backfilled in lifts. Backfill material shall be placed and compacted in lifts not to exceed 6 inches in depth to a height of 1 inch above the top of trench. Backfill shall be placed to obtain contact with the entire periphery of the pipe without disturbing pipe placement.
- G. Compaction: One of the following methods or combination thereof shall be required: (1) Mechanical Tamper, or (2) Vibratory Compactor. Compaction shall be sufficient to attain 95% of maximum density at optimum moisture content. Water "puddling" or "washing" is prohibited.
- H. Bedding/Backfill Material: Where native material has been removed, necessary foundation material consisting of 3/4 inch minus crushed rock or fill sand shall be placed and compacted to form a firm base of the required thickness. Backfill material shall be the same. Follow the pipe manufacturer's installation instructions when specified materials are specifically prohibited.

### 3.4 EQUIPMENT REMOVAL (NOT USED)

### 3.5 MECHANICAL EQUIPMENT WIRING

- A. Provide all motor starters, control devices, and wiring complete from power source indicated on Drawings.
- B. Equipment and systems shown on the Drawings and/or specified, are based upon requirements of specific manufacturers which are intended as somewhat typical of several makes which may be approved. Provide all field wiring and/or devices necessary for a complete and operable system controls for the actual selected equipment/system.

### 3.6 INSTALLATION

- A. Provide clearance for installation of insulation and access to valves, fittings, etc., on pipe systems.

- B. Locating and Positioning Equipment: Observe all Codes and Regulations and good common practice in locating and installing equipment and material so that completed installation presents the least possible hazard. Maintain recommended clearances for repair and service to all equipment.
- C. Installation shall be in accordance with the requirements of the equipment manufacturer, including special requirements for seismic restraints.
- D. Equipment Manufacturer's Responsibility and Services:
  - 1. A manufacturer's representative for major equipment and operating systems shall be provided as necessary to assist the Contractor during installation, and to provide written certification that the equipment has been installed as specified and in accordance with the manufacturer's representative.
  - 2. The manufacturer's representative shall provide the initial startup of equipment in the presence of the Owner.
    - a. Provide a pre-start check of all piping, valves, control devices, control panels, and equipment.
    - b. Calibrate and adjust equipment and controls for operation at the specified design and conditions.
    - c. Provide a record of all startup events noting problems and their resolution.
    - d. Provide a record of all set points for operational controls and devices.
  - 3. Upon the completion of the equipment startup, provide instructional time with the Owner's personnel to review the operations and maintenance manuals and perform each step necessary for startup, shutdown, troubleshooting, and routine maintenance. The instructional time shall be scheduled through the Owner.
  - 4. Upon completion of the inspections, startup, testing, and checkout procedures, the equipment manufacturer shall submit written notice to the Owner that the units are ready for use by the Owner. Provide a certificate of calibration for all equipment.
- E. Anchorage: Anchor and/or brace all mechanical equipment, piping and ductwork to resist displacement due to seismic action, include snubbers on equipment mounted on spring isolators.

### 3.7 INSPECTION

- A. The Contractor shall inspect his work to ensure the installation and workmanship is in accordance with these specifications and acceptable industry standards.
- B. All materials, equipment, and workmanship shall be subject to inspection at any time by the Owner. Contractor shall correct any work, materials, or equipment not in accordance with the Contract Documents.

### 3.8 SAFETY CONSIDERATIONS

- A. All equipment shall be installed with suitable access clearances that satisfy OSHA and code requirements for maintenance or removal of replaceable parts and components, and with necessary unions or flanges to perform the maintenance or removal without removing the connecting appurtenances.
- B. Where equipment or devices requiring periodic maintenance cannot be reached by normal walkways because of interference with ductwork, piping, or other obstructions the Contractor shall notify the Owner and propose an alternate safe means of access. These may include construction of an overhead platform with stairway or ladder ends and safety railings or handholds, or walk-through duct plenums with hinged access doors, or as required to meet OSHA standards for safe maintenance procedures.

### 3.9 CLEANING, START-UP, AND ADJUSTING

- A. The Contractors shall be responsible for proper operation of all systems, minor subsystems, and services provided under this section. He shall coordinate start-up procedures, calibration, and system checkout with all project managers. Any system operational problems shall be diagnosed; all correctional procedures shall be initiated as required to bring out the system into compliance with the design, and the problem then shall be rechecked to verify that the system operates normally.
- B. Thoroughly clean all parts of the installation at the completion of the work. The Contractor shall clean up and remove from the premises all refuse material, crates, and rubbish arising from his work.

### **END OF SECTION**

**SECTION 21 0500 - FIRE PROTECTION BASIC MATERIALS AND METHODS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Pipe, fittings, valves, and connections for sprinkler, standpipe and fire hose, and combination sprinkler and standpipe systems.

**1.2 RELATED REQUIREMENTS**

- A. Section 21 1300 - Fire Suppression Sprinklers: Sprinkler systems design.

**1.3 REFERENCE STANDARDS**

- A. ASTM D1785 - Standard specification for chlorinated Poly Vinyl chloride (CPVC) plastic.
- B. ASTM F442 - Standard specification for chlorinated poly vinyl chloride (CPVC) pipe.
- C. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; 2010.
- D. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
- E. UL 262 - Gate Valves for Fire-Protection Service; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
- F. UL 312 - Check Valves for Fire-Protection Service; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

**1.4 SUBMITTALS**

- A. Product Data: Provide manufacturers catalogue information. Indicate valve data and ratings.
- B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections. Shop drawings shall be minimum 36 x 24 size.
- C. Project Record Documents: Record actual locations of components and tag numbering.

- D. Operation and Maintenance Data: Include installation instructions and spare parts lists.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.

## 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.
- C. Conform to UL, FM, and Warnock Hersey requirements.
- D. Valves: Bear UL, FM, and Warnock Hersey label or marking. Provide manufacturer's name and pressure rating marked on valve body.
- E. Products Requiring Electrical Connection: Listed and classified as suitable for the purpose specified and indicated.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store valves in shipping containers, with labeling in place.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

# PART 2 PRODUCTS

## 2.1 FIRE PROTECTION SYSTEMS

- A. Sprinkler Systems: Conform work to NFPA 13R.

## 2.2 FLEXIBLE SPRINKLER HOSE FITTINGS

- A. FlexHead Industries flexible sprinkler connections.

## 2.3 PIPE HANGERS AND SUPPORTS

- A. Hangers for Pipe Sizes 1/2 to 1-1/2 inch (15 to 40 mm): Malleable iron or carbon steel, adjustable swivel, split ring.
- B. Hangers for Pipe Sizes 2 inches (50 mm) and Over: Carbon steel, adjustable, clevis.
- C. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- D. Wall Support for Pipe Sizes to 3 inches (80 mm): Cast iron hook.
- E. Vertical Support: Steel riser clamp or angle ring.
- F. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

## 2.4 GATE VALVES

- A. Up to and including 2 inches (50 mm):
  - 1. Bronze body, bronze trim, rising stem, handwheel, solid wedge or disc, threaded ends.
- B. Over 2 inches (50 mm):
  - 1. Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, handwheel, OS&Y, solid rubber covered bronze or cast iron wedge, flanged ends.

## 2.5 GLOBE OR ANGLE VALVES

- A. Up to and including 2 inches (50 mm):
  - 1. Bronze body, bronze trim, rising stem and handwheel, inside screw, renewable rubber disc, threaded ends, with backseating capacity repackable under pressure.
- B. Over 2 inches (50 mm):
  - 1. Iron body, bronze trim, rising stem, handwheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.

## 2.6 BALL VALVES

- A. Up to and including 3 inches:

1. Bronze two piece body, brass, chrome plated bronze, or stainless steel ball, teflon seats and stuffing box ring, lever handle and balancing stops, threaded ends with union.

## 2.7 CHECK VALVES

- A. Up to and including 2 inches (50 mm):
  1. Bronze body and swing disc, rubber seat, threaded ends.
- B. Over 2 inches (50 mm):
  1. Iron body, bronze trim, swing check with rubber disc, renewable disc and seat, flanged ends with automatic ball check.

## 2.8 DRAIN VALVES

- A. Ball Valve:
  1. Brass with cap and chain, 3/4 inch (20 mm) hose thread.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.

### 3.2 INSTALLATION

- A. Install sprinkler system and service main piping, hangers, and supports in accordance with NFPA 13R and manufacturer's recommended procedures.
- B. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- C. Install piping to conserve building space, to not interfere with use of space and other work.
- D. Group piping whenever practical at common elevations.
- E. Sleeve pipes passing through partitions, walls, and floors.

- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Follow manufacturer's recommended procedures.
- G. Pipe Hangers and Supports:
  - 1. Install hangers to provide minimum 1/2 inch (15 mm) space between finished covering and adjacent work.
  - 2. Place hangers within 12 inches (300 mm) of each horizontal elbow.
  - 3. Use hangers with 1-1/2 inch (40 mm) minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  - 4. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
  - 5. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
  - 6. Prime coat exposed steel hangers and supports. Refer to Section 09 9000. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- H. Slope piping and arrange systems to drain at low points. Use eccentric reducers to maintain top of pipe level.
- I. Do not penetrate building structural members unless indicated.
- J. Provide sleeves when penetrating footings, floors, and walls. Seal pipe and sleeve penetrations to achieve fire resistance equivalent to fire separation required.
- K. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.
- L. Install valves with stems upright or horizontal, not inverted. Remove protective coatings prior to installation.
- M. Provide gate, ball, or butterfly valves for shut-off or isolating service.
- N. Provide drain valves at main shut-off valves, low points of piping and apparatus.

- O. The fire sprinkler contractor shall coordinate and provide for the location of all fire sprinkler drain piping and drain receptor piping, whether or not indicated on the contract documents. The routing of low point drains to any location where there is no drain receptor is NOT acceptable.

**END OF SECTION**

**SECTION 21 1300 - FIRE SUPPRESSION SPRINKLERS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Wet-pipe sprinkler system.
- B. Dry-pipe sprinkler system.
- C. System design, installation, and certification.
- D. Fire department connections.

**1.2 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping.
- B. Section 21 0500 - Fire Protection Basic Materials and Methods: Pipe, fittings, and valves.

**1.3 REFERENCE STANDARDS**

- A. NFPA 13R - Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height; National Fire Protection Association; 2010.
- B. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.

**1.4 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week before starting work of this section.

**1.5 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

- C. Shop Drawings:
  - 1. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
  - 2. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls.
  - 3. Submit shop drawings, product data, and hydraulic calculations to authority having jurisdiction and Fire Marshall for approval. Submit proof of approval to Architect/Engineer.
  - 4. Shop drawings shall be minimum 36 x 24 size.
- D. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.
- E. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds code requirements.
- F. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Sprinklers: Type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
  - 3. Sprinkler Wrenches: For each sprinkler type.

## 1.6 QUALITY ASSURANCE

- A. Maintain one copy of referenced design and installation standard on site.
- B. Conform to UL requirements.
- C. Designer Qualifications: Design system under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in Oregon.
- D. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- E. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience approved by manufacturer.

- F. Equipment and Components: Provide products that bear UL label or marking.
- G. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

# PART 2 PRODUCTS

## 2.1 SPRINKLER SYSTEM

- A. Sprinkler System: Provide coverage for all 3-story apartments; entire building.
- B. Occupancy: Light hazard; comply with NFPA 13R..
- C. Water Supply: Determine volume and pressure from water flow test data.
  - 1. If test data is not available assume 2000gpm at 20 psig.
  - 2. Revise design when test data available prior to submittals.
- D. Interface system with building fire and smoke alarm system.
- E. Provide fire department connections as required by Authority Having Jurisdiction.
- F. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

## 2.2 SPRINKLERS

- A. Suspended Ceiling Type: Recessed pendant type with matching push on escutcheon plate.
  - 1. Manufacturers:
    - a. Tyco LFII Series.
    - b. Grinnell (GEM): [www.simplexgrinnell.com](http://www.simplexgrinnell.com).
    - c. Reliable: [www.reliablesprinkler.com](http://www.reliablesprinkler.com).
    - d. Central.
  - 2. Response Type: Fast.
  - 3. Coverage Type: Extended.
  - 4. Finish: White

5. Escutcheon Plate Finish: White
  6. Fusible Link: Fusible solder link type or Glass bulb type, temperature rated for specific area hazard.
- B. Exposed Area Type: Tyco type .
- C. Sidewall Type: Recessed horizontal sidewall type with matching push on escutcheon plate.
1. Manufacturers:
    - a. Tyco LFII Series.
    - b. Grinnell (GEM): [www.simplexgrinnell.com](http://www.simplexgrinnell.com).
    - c. Central.
    - d. Reliable: [www.reliablesprinkler.com](http://www.reliablesprinkler.com).
  2. Response Type: Fast.
  3. Coverage Type: Extended.
  4. Finish: White
  5. Escutcheon Plate Finish: White
  6. Fusible Link: Fusible solder link type or Glass bulb type, temperature rated for specific area hazard.

### 2.3 PIPING SPECIALTIES

- A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm and electric alarm, with pressure retard chamber and variable pressure trim; with test and drain valve.
- B. Dry Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm and electric alarm, with accelerator; with test and drain valve.
- C. Electric Alarm: Electrically operated red enameled gong with pressure alarm switch.
- D. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC. Grinnell Model VSR-1.
- E. Residential Domestic Shut-Off Valve: NFPA 13R, bronze and stainless steel construction, with sprinkler check valve assembly and poppet assembly to divert water from domestic system.
- F. Fire Department Connections:
  1. Type: Flush mounted wall type with brass finish.
  2. Outlets: Two way with thread size to suit fire department hardware; threaded dust cap and chain of matching material and finish.

3. Drain: 3/4 inch (19 mm) automatic drip, outside or connected to drain.
  4. Label: "Sprinkler - Fire Department Connection".
- G. Air Compressor: Single unit, electric motor driven, motor, motor starter, safety valves, check valves, air maintenance device incorporating electric pressure switch and unloader valve. Refer to Division 26 for electrical characteristics.
- H. Supervisory Switches: As manufactured by Grinnell OSYSU-1 or OSYSU-2, Potter-Roemer Figure 6220, or approved equal.

## 2.4 AIR COMPRESSOR

- A. Compressor: Single unit, electric motor driven, motor, motor starter, safety valves, check valves, air maintenance device incorporating electric pressure switch and unloader valve.
- B. Electrical Characteristics:
  1. Horsepower: Refer to Division 26.
  2. 60 Hz.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Install in accordance with referenced NFPA design and installation standard.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Install buried shut-off valves in valve box. Provide post indicator.
- D. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.
- E. Locate outside alarm gong on building wall. Use horn strobe where AHJ prefers.
- F. Place pipe runs to minimize obstruction to other work.
- G. Place piping in concealed spaces above finished ceilings.
- H. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.

- I. Flush entire piping system of foreign matter.
- J. Hydrostatically test entire system.
- K. Require test be witnessed by Fire Marshal and Architect/Engineer.

### 3.2 INTERFACE WITH OTHER PRODUCTS

- A. Ensure required devices are installed and connected as required to fire alarm system.

### 3.3 START-UP AND TESTING

- A. Starting Procedures: Follow manufacturer's written procedures. If no procedures are prescribed by manufacturer, proceed as follows:
  - 1. Verify that specialty valves, trim, fittings, controls, and accessories have been installed correctly and operate correctly.
  - 2. Verify that specified tests of piping are complete.
  - 3. Check that damaged sprinkler and sprinklers with paint or coating not specified have been replaced with new, correct type of sprinklers.
  - 4. Check that sprinklers are correct type, have correct finish and temperature ratings, and have guards where required for applications.
  - 5. Check that potable water supplies have correct type of backflow preventer.
  - 6. Check that hose valves and fire department connections have threads compatible with local fire department equipment and have correct pressure rating.
  - 7. Fill wet-pipe sprinkler systems with water.
  - 8. Energize circuits to electrical equipment and devices.
  - 9. Adjust operating controls and pressure settings.

### 3.4 DEMONSTRATION

- A. Demonstrate equipment, specialties, and accessories. Review operating and maintenance information.
- B. Schedule demonstration with at least 7 days advance notice.

## END OF SECTION

**SECTION 22 0001 - BASIC PLUMBING REQUIREMENTS - DESIGN BUILD****PART 1 GENERAL****1.1 DESCRIPTION OF WORK**

- A. This Section specifies the basic requirements for all Contractor installed equipment. It applies to all sections included in Division 22.
- B. Contractor shall provide complete engineering calculations and design of the plumbing system satisfying the direction and criteria of this specification and all other supporting documents and drawings.
- C. Provide all materials, labor and equipment required to install a complete and fully operational plumbing system as indicated by the contract drawings and this specification.
- D. Plans for the existing plumbing fixture layout are available from the Architect. Contractor shall be responsible for becoming familiar with these existing documents prior to the bid and include any and all costs associated with the modification, extension or addition to existing systems in order to meet the requirements of these documents.
- E. Contractor shall not compromise or diminish any existing building system, service or function in his execution of the work. Any such potential impacts shall be immediately brought to the attention of the Architect/Engineer.
- F. The plumbing work scope includes, but is not necessarily limited to the following.
  - 1. Install work per all applicable codes and the design criteria contained herein.
  - 2. Replace all existing CPVC water piping with PEX.
  - 3. Provide new angle stops at existing fixtures.
  - 4. Replace kitchen sink & faucet.
  - 5. Replace restroom lavatory & faucet.
  - 6. Replace water closets.
  - 7. Replace tub/shower & trim.
  - 8. Provide adequate isolation valves to allow maintenance without shut down of more than 20% of the occupant facilities at one time.
- G. Obtain and pay for all permits, licenses, fees and taxes applicable to this project as required by law.
- H. Cooperate with other trades in furnishing material and information required for installation and operation of mechanical items.

- I. Requirements for the following are included:
  1. Related work (other Contract Documents and specification sections) that must be combined with the requirements of this Section.
  2. Design performance.
  3. Delivery, storage, and handling.
  4. Quality assurance and standards.
  5. Submittals.
  6. Product quality, basic type, and finishes.
  7. Equipment identification.
  8. Design criteria.
  9. Excavation and backfill.
  10. Installation.
  11. Inspection.
  12. Cleaning, startup, and adjustments.

## 1.2 RELATED WORK

- A. This general section shall be used in conjunction with the following other specifications and related Contract Documents to establish the total requirements for the project equipment and systems:
  1. Division 1 sections included in this Project specifications.
  2. The Contract.
  3. General and specific mechanical specifications and drawings included in the project.

CAUTION: Use of this Section without including all of the above listed items will result in omission of basic requirements.

## 1.3 DEFINITIONS

- A. “Indicated”: Refers to graphic representations, notes or schedules in the Drawings; or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents.
  1. Terms such as “shown”, “noted”, “scheduled”, and “specified”, are used to notify or help the user to locate reference. Location is not limited.
- B. “Directed”: Terms such as “directed”, “Requested”, “authorized”, “selected”, “approved”, “required”, and “permitted” mean directed by Architect/Engineer, approved by Architect/Engineer and similar phrases.

- C. “Approved”: When used in conjunction with Architect/Engineer's action on contract submittals, applications, requests, is limited to Architect/Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- D. “Regulations”: Includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of Work.
- E. “Furnish”: Means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation and similar operations.
- F. “Install”: Describes operations at Project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, supporting, isolating, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.
- G. “Provide”: Means to furnish and install.
- H. “Installer”: A contractor, or another entity engaged by the contractor, either as an employee, subcontractor, or contractor of a lower tier, to perform a particular construction activity including installation, erection, application or similar operations.
  - 1. Installers are required to be experienced in operations they are engaged to perform.
  - 2. The term “experience” means having successfully completed a minimum of three previous projects similar in scope and size to this Project and within the time frame indicated in the “Quality Assurance” section of the Specifications. In addition, it means being familiar with special requirements indicated and having complied with requirements of authorities having jurisdiction.
- I. “Project Site”: Is defined as the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project.

#### 1.4 DESIGN PERFORMANCE

- A. Compliance by the Contractor and/or Vendor with the provisions of this Specification does not relieve him of the responsibilities of furnishing equipment and materials of proper design, mechanically suited to meet operating guarantees at the specified service conditions.

#### 1.5 SUBMITTALS

- A. Product Data: Submit five complete sets of manufacturer's product data in a three ring binder for approval. Literature submitted shall clearly indicate the reference specification

number, model number, capacity, rated operating conditions, size, weight, support requirements, electrical power requirements, utility (fuel, air, cooling water, etc.) requirements, and options furnished. Submittals shall include, but are not necessarily limited to the following;

1. Plumbing: Piping and insulation; Plumbing fixtures, including trim; insulation; valves; hangers and supports; equipment bases; isolators; water heaters; booster pumps and the like.
2. Calculations: Provide for sizing of all utility services, including waste, water, and gas; water heater sizing; pumps head and flow sizing for all systems; thermal expansion and seismic restraints; and all other calculations consistent with good engineering practice. Include design criteria used and assumptions made.

B. Operation and Maintenance Data: Submit three complete sets of manufacturer's literature bound in a three ring binder for approval. Data shall include installation, start-up, and maintenance instructions, parts lists, and wiring diagrams.

C. Substitutions: System design was based upon the equipment and materials listed on the drawings and specifications herein. At contractor's option, another manufacturer's equipment of similar quality, capacity and features may be submitted for prior approval per Section 01 3300. Prior permission to substitute does not relieve the contractor of the responsibility of including this information in the bound submittal packages.

## 1.6 QUALITY ASSURANCE

A. Codes and Standards: Comply with the provisions of the latest versions of the following codes, standards and specifications, except where more stringent requirements are shown or specified:

1. State of Oregon "IBC".
2. State of Oregon "IMC".
3. State of Oregon "UPC".
4. State of Oregon "IFC".
5. ANSI B31.9 "Building Service Piping".
6. SMACNA - "HVAC Duct Construction Standards".
7. NFPA - Sections 54 and 90B.

B. Drawings: All drawings are diagrammatic and show general design, arrangement, and extent of the systems. Do not scale drawings for rough-in dimensions, nor use as shop drawings.

C. Installer Qualifications: Company specializing in performing the work required with a minimum of five years documented experience.

## 1.7 DELIVERY, STORAGE AND PROTECTION

- A. Delivery: Deliver to site with manufacturer's labels intact and legible.
- B. Preparation for shipment:
  1. Each unit shall be suitably prepared for the shipment specified and for storage in accordance with manufacturer's instructions in a manner requiring no disassembly prior to operation.
  2. The Contractor shall be solely responsible for the adequacy of the Preparation for Shipment provisions employed with respect to materials and application.
  3. One complete set of Installations, Operating and Maintenance Instructions shall be packed and shipped with the equipment. This set is in addition to the sets that are to be sent directly to the Owner.
- C. Handling: Avoid damage. Comply with manufacturer's installation instruction requirements for rigging, unloading and transporting units.
- D. Storage: Inside protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping. Cap all pipe ends. Taping pipe ends is not adequate or allowable.

## 1.8 PROJECT CONDITIONS

- A. General: Provide products that are compatible with other portions of the work and provide products with the proper power characteristics and similar adaptations for the project.
- B. Arrangement: Arrange piping parallel with primary lines of the building construction and with a minimum 7 feet overhead clearance in unfinished equipment rooms where possible. Conceal all piping and ductwork where possible unless indicated otherwise. Locate operating and control equipment properly to provide easy access for operation and maintenance. Give right-of-way to piping which must be sloped for drainage. Set all equipment level or as recommended by manufacturer.
- C. Coordination: Where several elements of the work must be sequenced and positioned in order to fit the available space, prepare shop drawings showing the actual physical dimensions (at accurate scale) required for installation and submit prior to purchase/fabrication/installation of any of the elements involved in the coordination.

## 1.9 STANDARDS

- A. General: Provide all new materials and equipment, identical to apparatus or equipment in successful operation for a minimum of five years. Provide materials of comparable quality

omitted here but necessary to complete the work. Maximum allowable variation from stated capacities, minus 5% to plus 10% as approved in each case.

- B. Governing Standards: The following are typical standards generally referenced in these specifications and identified by their acronym. Federal Specifications (FS), American Society for Testing Materials (ASTM), American National Standards Institute (ANSI), Manufacturer's Standardization Society of the Valve and Fitting Industry, Standard Practice (MSS SP-69), Cast Iron Soil Pipe Institute (CISPI), Underwriters Laboratory (UL) numbers are given.

## 1.10 WARRANTIES

- A. Contractor shall provide a 1-year warranty on all equipment, materials and workmanship for a period of one year from the date of owner's acceptance.

## PART 2 PRODUCTS (NOT USED)

## PART 3 EXECUTION

### 3.1 LAYOUT AND COORDINATION

- A. Site Examination: Before starting work, carefully examine site and all Contract Drawings. Become thoroughly familiar with conditions governing work on this project. Verify all indicated elevations, building measurements, rough-in dimensions and equipment locations before proceeding with any work.
- B. Utility Locations: All on-site utilities to be new. See civil.
- C. Discrepancies: Any error, conflict or discrepancy in Specifications and/or existing conditions shall be reported immediately. Do not proceed with any questionable items of work until clarification of same has been made. Under no circumstances shall beams, girders, footings, or columns be cut for mechanical items. Casting of pipes into concrete is prohibited.

### 3.2 DESIGN CRITERIA

- A. Plumbing:
1. Maximum domestic water piping velocity is to be 7 feet per second for cold water and 5 feet per second for hot water.
  2. Provide pumped hot water recirculation, as required, capable of supplying hot water to all fixtures within 15 seconds.

### 3.3 EXCAVATION AND BACKFILL

- A. General: Perform all necessary excavation and backfill required for the installation of mechanical work. Any piping or other work damaged by the Contractor's operations shall be repaired at the Contractor's expense.
- B. Water: Keep all excavations free of standing water. Excavations damaged or softened by water or frost shall be reexcavated and filled back to original level with approved material at the Contractor's expense.
- C. Test: During the progress of the work for compacted fill, the Owner reserves the right to request compaction tests made under the direction of a testing laboratory.
- D. Trench Excavation: Excavate trenches to the necessary depth and width, removing rocks, unstable soil (silt, peat, etc.) roots and stumps. Width of trench shall be adequate for proper installation of piping or conduit.
- E. Foundation and Bedding:
  - 1. Proper preparation of foundation, placement of foundation material where required, and placement of bedding material shall precede the installation of the pipe. This shall include leveling of the trench bottom as well as placement and compaction of required bedding material to a uniform grade so that piping rests upon continuous and uniform bedding.
  - 2. Where excavation has been made below the required grade, the Contractor shall provide, place and compact suitable bedding material to restore the proper grade elevation.
- F. Provide tracer wire over top of piping.
  - 1. Construction:
    - a. Conductor: Solid or stranded copper per spec ASTM B-3.
    - b. Insulation: High Molecular Weight Polyethylene (HMWPE) ASTM D-1248. Various insulation colors dependant on usage.
    - c. Temperature: 70 degrees C dry and wet.
    - d. Voltage: 20 and 30 Mil = 30 to 300 volts. 45 Mil = 600 volts.
- G. Backfilling: Upon acceptance of installed piping systems, trenches shall be backfilled in lifts. Backfill material shall be placed and compacted in lifts not to exceed 6 inches in depth to a height of 1 inch above the top of trench. Backfill shall be placed to obtain contact with the entire periphery of the pipe without disturbing pipe placement.
- H. Compaction: One of the following methods or combination thereof shall be required: (1) Mechanical Tamper, and (2) Vibratory Compactor. Compaction shall be sufficient to attain

95% of maximum density at optimum moisture content. Water "puddling" or "washing" is prohibited.

- I. Bedding/Backfill Material: Where native material has been removed, necessary foundation material consisting of 3/4 inch minus crushed rock or fill sand shall be placed and compacted to form a firm base of the required thickness. Backfill material shall be the same. Follow the pipe manufacturer's installation instructions when specified materials are specifically prohibited.

#### 3.4 EQUIPMENT REMOVAL (NOT USED)

#### 3.5 MECHANICAL EQUIPMENT WIRING (NOT USED)

#### 3.6 INSTALLATION

- A. Provide clearance for installation of insulation and access to valves, fittings, damper actuators, etc. on pipe and duct systems.
- B. Flush clean and disinfect domestic water system.
- C. Provide chrome plated rigid or flexible supplies to fixtures with stops, reducers, and escutcheons.
- D. Locating and Positioning Equipment: Observe all Codes and Regulations and good common practice in locating and installing mechanical equipment and material so that completed installation presents the least possible hazard. Maintain recommended clearances for repair and service to all equipment.
- E. Installation shall be in accordance with the requirements of the equipment manufacturer, including special requirements for seismic restraints.
- F. Anchorage: Anchor and/or brace all mechanical equipment, piping and ductwork to resist displacement due to seismic action, include snubbers on equipment mounted on spring isolators.

#### 3.7 INSPECTION

- A. The Contractor shall inspect his work to ensure the installation and workmanship is in accordance with these specifications and acceptable industry standards for the work being done.

- B. All materials, equipment, and workmanship shall be subject to inspection at any time by the Owner. Contractor shall correct any work, materials, or equipment not in accordance with the Contract Documents.

**3.8 SAFETY CONSIDERATIONS (NOT USED)**

**3.9 CLEANING, START-UP, AND ADJUSTING**

- A. The Contractors shall be responsible for proper operation of all systems, minor subsystems, and services provided under this section. He shall coordinate start-up procedures, calibration, and system checkout with all project managers. Any system operational problems shall be diagnosed; all correctional procedures shall be initiated as required to bring out the system into compliance with the design, and the problem then shall be rechecked to verify that the system operates normally.
- B. Thoroughly clean all parts of the installation at the completion of the work. The Contractor shall clean up and remove from the premises all refuse material, crates, and rubbish arising from his work.

**END OF SECTION**

**SECTION 22 1005 - PLUMBING PIPING****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Pipe, pipe fittings, valves, and connections for piping systems.
  - 1. Sanitary sewer.
  - 2. Domestic water.
  - 3. Storm water.

**1.2 RELATED REQUIREMENTS**

- A. Section 07 84 13 - Penetration Firestopping.

**1.3 REFERENCE STANDARDS**

- A. ANSI Z21.22 - American National Standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems; 1999, and addenda A&B (R2004).
- B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2012 (ANSI B16.18).
- C. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2001 (R2010).
- D. ASME B31.9 - Building Services Piping; The American Society of Mechanical Engineers; 2011 (ANSI/ASME B31.9).
- E. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2007.
- F. ASTM B32 - Standard Specification for Solder Metal; 2008.
- G. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes; 2010.
- H. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2009.
- I. ASTM D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable; 2012.

- J. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings; 2004 (Reapproved 2011).
- K. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2004 (Reapproved 2009).
- L. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2012.
- M. ASTM D2680 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly(Vinyl Chloride) (PVC) Composite Sewer Piping; 2001 (Reapproved 2009).
- N. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings; 1996 (Reapproved 2010).
- O. ASTM F628 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core; 2008.
- P. ASTM F876 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing; 2010.
- Q. ASTM F877 - Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems; 2011.
- R. AWS A5.8/A5.8M - Specification for Filler Metals for Brazing and Braze Welding; American Welding Society; 2011 and errata.
- S. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications; Cast Iron Soil Pipe Institute; 2005.
- T. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; Cast Iron Soil Pipe Institute; 2004
- U. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2009.
- V. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2008.

#### 1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Shop Drawings: For non-penetrating rooftop supports, submit detailed layout developed for this project, with design calculations for loadings and spacings.
- D. Project Record Documents: Record actual locations of valves.

#### 1.5 QUALITY ASSURANCE

- A. Perform work in accordance with all applicable local codes and standards.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.

#### 1.6 REGULATORY REQUIREMENTS

- A. Perform work in accordance with applicable plumbing code.
- B. Conform to applicable code for installation of backflow prevention devices.
- C. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system. Store pipe on sleepers, a minimum of 4 inches (102 mm) above surrounding grade, at all times.

**PART 2 PRODUCTS****2.1 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING**

- A. Cast Iron Pipe: CISPI 301, hubless.
  - 1. Fittings: Cast iron.
  - 2. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies. Mission Heavyweight, Husky 4000, Clamp-All 120 system, or approved.
- B. ABS Pipe: ASTM D2751 or ASTM F628.
  - 1. Fittings: ABS.
  - 2. Joints: Solvent welded with ASTM D2235 cement.
- C. PVC Pipe: ASTM D2665 or ASTM D3034.
  - 1. Fittings: PVC.
  - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

**2.2 SANITARY SEWER PIPING, ABOVE GRADE**

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.
  - 1. Fittings: Cast iron.
  - 2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.
- B. ABS Pipe: ASTM D2751 or ASTM F628.
  - 1. Fittings: ABS.
  - 2. Joints: Solvent welded with ASTM D2235 cement.
- C. PVC Pipe: ASTM D2729.
  - 1. Fittings: PVC.
  - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.
- D. PVC Pipe: ASTM D2665.
  - 1. Fittings: PVC.
  - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

**2.3 WATER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING**

- A. Copper Pipe: ASTM B88, Type K annealed.
  - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
  - 2. Joints: AWS A5.8, BCuP silver braze.

**2.4 WATER PIPING, ABOVE GRADE**

- A. Copper Tube: ASTM B88, Type L (B), Drawn (H).
  - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
  - 2. Joints: ASTM B32, alloy Sn95 solder.
- B. PEX Tube: ASTM F876, SDR 9.
  - 1. Fittings: ASTM F877, brass insert type with metal bands or brass or plastic compression type matching tube dimensions.
  - 2. Manifold: ASTM F877, multi-outlet, corrosion resistant metal assembly with corrosion resistant metal valve for each outlet.

**2.5 STORM WATER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING**

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.
  - 1. Fittings: Cast iron.
  - 2. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies. Mission Heavyweight, Husky 4000, Clamp-All 120 system, or approved.
- B. ABS Pipe: ASTM D2680 or ASTM D2751.
  - 1. Fittings: ABS.
  - 2. Joints: Solvent welded with ASTM D2235 cement.
- C. PVC Pipe: ASTM D2665, ASTM D3034, or ASTM F679.
  - 1. Fittings: PVC.
  - 2. Joints: Push-on, using ASTM F477 elastomeric gaskets.

**2.6 STORM WATER PIPING, ABOVE GRADE**

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.

1. Fittings: Cast iron.
  2. Joints: Neoprene gaskets and stainless steel clamp-and-shield assemblies.
- B. ABS Pipe: ASTM D2680 or ASTM D2751.
1. Fittings: ABS.
  2. Joints: Solvent welded with ASTM D2235 cement.
- C. PVC Pipe: ASTM D2665 or ASTM D3034.
1. Fittings: PVC.
  2. Joints: Solvent welded, with ASTM D2564 solvent cement.

## 2.7 FLANGES, UNIONS, AND COUPLINGS

- A. Unions for Pipe Sizes 3 Inches (80 mm) and Under:
1. Ferrous pipe: Class 150 malleable iron threaded unions.
  2. Copper tube and pipe: Class 150 bronze unions with soldered joints.
- B. Flanges for Pipe Size Over 1 Inch (25 mm):
1. Ferrous pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
  2. Copper tube and pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- C. Dielectric Connections: Bronze threaded nipple, minimum 3 inches long, with impervious isolation liner. Victaulic "Clearflow".

## 2.8 PIPE HANGERS AND SUPPORTS

- A. Manufacturers:
1. Tolco Inc.
  2. Anvil.
  3. Hubbard Enterprises/Holdrite.
  4. Michigan Hanger Company, Inc.
  5. PHD Manufacturing Co.
  6. Superstrut.
  7. Unistrut.
- B. Provide hangers and supports that comply with MSS SP-58.

1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
  2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
    - a. Cold and Hot Pipe Sizes 6 Inches (150 mm) and Over: Double hangers.
    3. Trapeze Hangers: Welded steel channel frames attached to structure.
    4. Vertical Pipe Support: Steel riser clamp. Isolate riser clamp from structure by use of Hubbard Enterprises/Holdrite #274 or #278 riser pad or Owner-approved equivalent.
- C. Plumbing Piping - Drain, Waste, and Vent:
1. Hangers for Pipe Sizes 1/2 Inch (15 mm) to 1-1/2 Inches (40 mm): Malleable iron, adjustable swivel, split ring.
  2. Hangers for Pipe Sizes 2 Inches (50 mm) and Over: Carbon steel, adjustable, clevis.
  3. Wall Support for Pipe Sizes to 3 Inches (80 mm): Cast iron hook.
  4. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- D. Plumbing Piping - Water:
1. Hangers for Pipe Sizes 1/2 Inch (15 mm) to 1-1/2 Inches (40 mm): Malleable iron, adjustable swivel, split ring.
  2. Hangers for Cold Pipe Sizes 2 Inches (50 mm) and Over: Carbon steel, adjustable, clevis.
  3. Hangers for Hot Pipe Sizes 2 Inches (50 mm) to 4 Inches (100 mm): Carbon steel, adjustable, clevis.
  4. Hangers for Hot Pipe Sizes 6 Inches (150 mm) and Over: Adjustable steel yoke, cast iron pipe roll, double hanger.
  5. Wall Support for Pipe Sizes to 3 Inches (80 mm): Cast iron hook.
  6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
  7. Use non-metallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
  8. For vertical midspan support of piping 4 inches (102 mm) and under, use Hubbard Enterprises/Holdrite Stout Bracket in conjunction with Hubbard Enterprises/Holdrite Stout Clamp or industry standard two-hole pipe clamp (MSS Type 26).
  9. Secondary Pipe Positioning and Supports:
    - a. Makeshift, field-devised methods of plumbing pipe support, such as the use of scrap framing materials, are not allowed. Support and positioning of piping shall be by means of engineered methods that comply with IAPMO PS 42-96. These are to be Hubbard Enterprises/Holdrite support systems or approved equal.
- E. Hanger Fasteners: Attach hangers to structure using appropriate fasteners, follow manufacturer's guidelines.

## 2.9 ACCESSORIES

- A. Hanger Rods: Mild steel, threaded both ends, threaded on one end, or continuous threaded.

## 2.10 FLASHING

- A. Metal Flashing: 26 gage (1.73 mm) thick galvanized steel.
- B. Metal Counterflashing: 22 gage (1.47 mm) thick galvanized steel.
- C. Flexible Flashing: 1.85 inch (47 mm) thick sheet butyl; compatible with roofing.
- D. Caps: Steel, 22 gage (1.47 mm) minimum; 16 gage (1.07 mm) at fire resistant elements.

## 2.11 SLEEVES

- A. Sleeves for Pipes Through Non-fire Rated Floors: 18 gage (1.2 mm) thick galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage (1.2 mm) thick galvanized steel.

## 2.12 MECHANICAL SLEEVE SEALS

- A. Manufacturers:
  1. Thunderline Link-Seal, Inc. Model Series LS.
  2. NMP Corporation.

3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

## 2.13 FORMED STEEL CHANNEL

- A. Manufacturers:
  1. Unistrut Model Series P1000.
  2. Superstrut Model Series 1200.

3. Michigan Hanger "O-Strut" Model A-12.
- B. Product Description: Galvanized 12 gage (0.8 mm) thick steel. With holes 1-1/2 inches (38 mm) on center.

## 2.14 FIRESTOPPING

- A. Manufacturers:
1. Specified Technology Inc. (STI) Model SpecSeal Series 100.
  2. Dow Corning Corp.
  3. Hilti Corp.
  4. International Protective Coating Corp.
  5. 3M fire Protection Products.
- B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
1. Silicone Firestopping Elastomeric Firestopping: Single or multiple component silicone elastomeric compound and compatible silicone sealant.
  2. Foam Firestopping Compounds: Single or Multiple component foam compound.
  3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
  4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
  5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
  6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
  7. Firestop Pillows: Formed mineral fiber pillows.
- C. Color: As selected from manufacturer's full range of colors.

## 2.15 FIRESTOPPING ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- B. Dam Material: Permanent:
1. Mineral fiberboard.
  2. Mineral fiber matting.

3. Sheet metal.
  4. Plywood or particle board.
  5. Alumina silicate fire board.
- C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
- D. General:
1. Furnish UL listed products.
  2. Select products with rating not less than rating of wall or floor being penetrated.
- E. Non-Rated Surfaces:
1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where piping is exposed.
  2. For exterior wall openings below grade, furnish mechanical sealing device to continuously fill annular space between piping and cored opening or water-stop type wall sleeve.

## 2.16 BALL VALVES

- A. Manufacturers:
1. Hammond Valve Co.; Model 8501/8901: [www.hammondvalve.com](http://www.hammondvalve.com).
  2. Nibco, Inc.; Model T-FP-600/T-585-70: [www.nibco.com](http://www.nibco.com).
  3. Watts; Model FBV-1/B-6000: [www.watts.com](http://www.watts.com).
  4. Stockham; Model S216-BR-R-T: [www.stockham.com](http://www.stockham.com).
  5. Apollo; Model 70-100: [www.conbraco.com](http://www.conbraco.com).
  6. Milwaukee Valve Company; Model BA-125/BA-100: [www.milwaukeevalve.com](http://www.milwaukeevalve.com).

## 2.17 FLOW CONTROLS

- A. Manufacturers:
1. ITT Bell & Gossett: [www.bellgossett.com](http://www.bellgossett.com).
  2. Griswold Controls: [www.griswoldcontrols.com](http://www.griswoldcontrols.com).
  3. Taco, Inc: [www.taco-hvac.com](http://www.taco-hvac.com).
- B. Construction: Class 125, Brass or bronze body with union on inlet and outlet, temperature and pressure test plug on inlet and outlet, blowdown/backflush drain.
- C. Calibration: Control flow within 5 percent of selected rating, over operating pressure range of 10 times minimum pressure required for control, maximum minimum pressure [ ].5 psi.

## 2.18 SWING CHECK VALVES

- A. Manufacturers:
  - 1. Hammond Valve; Model IB940/IR1124: [www.hammondvalve.com](http://www.hammondvalve.com).
  - 2. Nibco, Inc.; Model T-413/F-918B: [www.nibco.com](http://www.nibco.com).
  - 3. Stockham; Model B-320/G-931: [www.stockham.com](http://www.stockham.com).
  - 4. Milwaukee Valve Company; Model F-2974: [www.milwaukeevalve.com](http://www.milwaukeevalve.com).
- B. Up to 3 Inches (80 mm):
  - 1. MSS SP-80, Class 125, bronze body and cap, bronze swing disc with rubber seat, solder or threaded ends.
- C. Over 3 Inches (80 mm):
  - 1. MSS SP-71, Class 125, iron body, bronze fitted, renewable disc seal and seat, flanged ends.

## 2.19 WATER PRESSURE REDUCING VALVES

- A. Manufacturers:
  - 1. Watts Regulator Company: [www.wattsregulator.com](http://www.wattsregulator.com).
  - 2. Cash-Acme: [www.cashacme.com](http://www.cashacme.com).
  - 3. Zurn/Wilkins: [www.zurn.com](http://www.zurn.com).
- B. Up to 2 Inches (50 mm):
  - 1. MSS SP-80, bronze body, stainless steel and thermoplastic internal parts, fabric reinforced diaphragm, strainer, threaded single union ends.
- C. Over 2 Inches (50 mm):
  - 1. MSS SP-85, cast iron body, bronze fitted, elastomeric diaphragm and seat disc, flanged.

## 2.20 RELIEF VALVES

- A. Pressure Relief:
  - 1. Manufacturers:
    - a. Watts Regulator Company: [www.wattsregulator.com](http://www.wattsregulator.com).
    - b. Cash-Acme: [www.cashacme.com](http://www.cashacme.com).
    - c. Zurn/Wilkins: [www.zurn.com](http://www.zurn.com).

2. AGA Z21.22 certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.

B. Temperature and Pressure Relief:

1. Manufacturers:
  - a. Watts Regulator Company: [www.wattsregulator.com](http://www.wattsregulator.com).
  - b. Cash-Acme: [www.cashacme.com](http://www.cashacme.com).
  - c. Zurn/Wilkins: [www.zurn.com](http://www.zurn.com).
2. AGA Z21.22 certified, bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, temperature relief maximum 210 degrees F (98.9 degrees C), capacity ASME (BPV IV) certified and labelled.

## 2.21 STRAINERS

A. Manufacturers:

1. Watts Regulator Company: [www.wattsregulator.com](http://www.wattsregulator.com).
2. Hammond Valve: [www.hammondvalve.com](http://www.hammondvalve.com).
3. Milwaukee Valve Company: [www.milwaukeevalve.com](http://www.milwaukeevalve.com).
4. Apollo: [www.conbraco.com](http://www.conbraco.com).
5. Stockham: [www.stockham.com](http://www.stockham.com).
6. Nibco, Inc.: [www.nibco.com](http://www.nibco.com).

B. Size 2 inch (50 mm) and Under:

1. Threaded brass body for 175 psi (1200 kPa) CWP, Y pattern with 1/32 inch (0.8 mm) stainless steel perforated screen.
2. Class 150, threaded bronze body 300 psi (2070 kPa) CWP, Y pattern with 1/32 inch (0.8 mm) stainless steel perforated screen.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

### 3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.

- C. Prepare piping connections to equipment with flanges or unions.

### 3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 22 0516.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 22 0719.
- H. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors with Section 08 3100.
- I. Establish elevations of buried piping outside the building to ensure not less than 2 ft (0.7 m) of cover.
- J. Provide tracer wire over top of piping.
  - 1. Construction:
    - a. Conductor: Solid or stranded copper per spec ASTM B-3.
    - b. Insulation: High Molecular Weight Polyethylene (HMWPE) ASTM D-1248.  
Various insulation colors dependant on usage.
    - c. Temperature: 70 degrees C dry and wet.
    - d. Voltage: 20 and 30 Mil = 30 to 300 volts. 45 Mil = 600 volts.
- K. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- L. Provide support for utility meters in accordance with requirements of utility companies.
- M. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09 9000.

- N. Excavate in accordance with Section 31 2316.
- O. Backfill in accordance with Section 31 2323.
- P. Install bell and spigot pipe with bell end upstream.
- Q. Install valves with stems upright or horizontal, not inverted.
- R. Pipe vents from gas pressure reducing valves to outdoors and terminate in weather proof hood.
- S. Install water piping to ASME B31.9.
- T. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- U. Sleeve pipes passing through partitions, walls and floors.
- V. Pipe Hangers and Supports:
  1. Install in accordance with ASME B31.9.
  2. Support horizontal piping as scheduled.
  3. Install hangers to provide minimum 1/2 inch (15 mm) space between finished covering and adjacent work.
  4. Place hangers within 12 inches (300 mm) of each horizontal elbow.
  5. Use hangers with 1-1/2 inch (40 mm) minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  6. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
  7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
  8. Provide copper plated hangers and supports for copper piping or sheet lead packing between hanger or support and piping.
  9. Support cast iron drainage piping at every joint.
  10. Support of pipe tubing and equipment is to be accomplished by means of engineered products specific to each application. Makeshift field devised methods will not be allowed.

### 3.4 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.

- B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- C. Install ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- D. Install globe or ball valves for throttling, bypass, or manual flow control services
- E. Provide flow controls in water recirculating systems where indicated.

### 3.5 TOLERANCES

- A. Drainage Piping: Establish invert elevations within 1/2 inch (10 mm) vertically of location indicated and slope to drain at minimum of 1/4 inch per foot (1:50) slope unless otherwise noted.
- B. Water Piping: Slope at minimum of 1/32 inch per foot (1:400) and arrange to drain at low points.

### 3.6 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, verify system is complete, flushed and clean.
- B. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

## END OF SECTION

**SECTION 22 4000 - PLUMBING FIXTURES****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Water closets.
- B. Lavatories.
- C. Sinks.
- D. Bathtubs/Showers.

**1.2 RELATED REQUIREMENTS**

- A. Section 22 1005 - Plumbing Piping.

**1.3 REFERENCE STANDARDS**

- A. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
- B. ANSI Z124.1.2 - American National Standard for Plastic Bathtub and Shower Units; 2005.
- C. ASME A112.18.1 - Plumbing Supply Fittings; The American Society of Mechanical Engineers; 2012.
- D. ASME A112.19.3 - Stainless Steel Plumbing Fixtures (Designed for Residential Use); The American Society of Mechanical Engineers; 2008.

**1.4 SUBMITTALS**

- A. See Section 01 33 00 - Administrative Requirements, for submittal procedures
- B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
- C. Manufacturer's Instructions: Indicate installation methods and procedures.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

- E. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Section 01 7000 - Execution and Closeout Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit fixture, trim, exploded view and replacement parts lists.

#### 1.6 QUALITY ASSURANCE

- A. Perform work in accordance with applicable codes.
- B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience, and with service facilities within 100 miles of project.
- C. Installer Qualifications: Company specializing in performing work of this section with minimum three years experience.

#### 1.7 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 6000 - Product Requirements: Product storage and handling requirements.
- B. Accept fixtures on site in factory packaging. Inspect for damage.
- C. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

## 1.9 WARRANTY

- A. Section 01 7000 - Execution and Closeout Requirements: Product warranties and product bonds.

## PART 2 PRODUCTS

### 2.1 TANK TYPE WATER CLOSET (RESIDENTIAL) WC-1

A. Manufacturers:

1. Bowl: ASME A112.19.2M; floor mounted, siphon jet, vitreous china, 12 inch rough-in, 2-1/8 inch fully glazed trapway 15 inches high close-coupled closet combination with round rim, insulated vitreous china closet tank with fittings and lever flushing valve, bolt caps vandal proof cover locking device.
2. Seat: Solid white plastic, open front, with cover, life and clean hinges system, post nuts and washers. American Standard Model 5322.001.020.

### 2.2 LAVATORIES (COUNTER MOUNT)

A. Manufacturers:

1. Vitreous China Counter Top Basin: ASME A112.19.2M; vitreous china self-rimming counter top lavatory, 20 x 17 inches with drillings on 8 inch centers, front overflow, seal of putty, caulking, or concealed vinyl gasket.
2. Supply Fitting: ASME A112.18.1; chrome plated combination supply fitting with open grid strainer, water economy aerator with maximum 2.0 gpm flow, single lever handle. Delta Model 523-HDF, Symmons Model S-20-2-G, Moen Model 8432, Chicago Model 2201-4 "Marathon".
3. Supply Fitting: ASME A112.18.1; chrome plated combination supply fitting with open grid strainer, water economy aerator with maximum 2.0 gpm flow, indexed handles. Delta Model 2529-HDF, Symmons Model S-240-2-G-LWG, Moen Model 8800, Chicago Model 802A-317.
4. Accessories:
  - a. Drain: open grid, chrome plated cast brass one piece top, 1/16 inch thick, tubular 1-1/4 inch tailpiece.
  - b. P-trap: 1-1/4 inch, 17 gage chrome plated brass with clean-out plug, box flange.
  - c. Supplies: chrome plated brass, heavy duty angle stop, 1/2 inch inlet by 3 inch long rigid horizontal nipple, combination vandal proof loose key handle, escutcheon.
  - d. Provide pop up waste on residential lavatories.
  - e. Rigid supplies.
  - f. Trap and waste insulated and offset to meet ADA compliance.
  - g. Brasscraft, Speedway, Eastman or McGuire.

## 2.3 SINKS (SINGLE COMPARTMENT)

### A. Manufacturers:

1. As indicated on Drawings.
2. Single Compartment Bowl: ASME A112.19.3; 25 x 22 x 7 inch outside dimensions, 20 gage thick, Type 304 stainless steel. Self-rimming and undercoated, with 1-1/2 inch chromed brass drain, 3-1/2 inch crumb cup and tailpiece, ledge back drilled for trim.
3. Trim: ASME A112.18.1; chrome plated brass supply with 8 inch swing spout, vandal proof water economy aerator with maximum 2.2 gpm flow, single lever handle. Delta Model 100-WFELHHDF, Symmons Model S-23-2, Moen Model 8710, Chicago Model 2300-8 "Marathon".
4. Trim: ASME A112.18.1; chrome plated brass supply with 6 inch goose neck swing spout, vandal proof water economy aerator with maximum 2.2 gpm flow, ADA compliant indexed lever handles. Cambridge/Delta 26T2944, Moen Model 8123 w/S0003 spout, Chicago Model 527 w/Model 317 blade handles.
5. Accessories: Chrome plated 17 gage brass P-trap with clean-out plug and arm with escutcheon, screwdriver stop, rigid supplies.

## 2.4 SINKS (DOUBLE COMPARTMENT)

### A. Manufacturers:

1. As indicated on Drawings.
2. Double Compartment Bowl: ASME A112.19.3; 33 x 22 x 7 inch 20 gage thick, Type 304 stainless steel. Self-rimming and undercoated, with 1-1/2 inch chromed brass drains 3-1/2 inch crumb cups and tailpieces, ledge back drilled for trim.
3. Trim: ASME A112.18.1; chrome plated brass supply with 8 inch swing spout, vandal proof water economy aerator with maximum 2.2 gpm flow, single lever handle. Delta Model 100-WFELHHDF, Symmons Model S-23-2, Moen Model 8710, Chicago Model 2300-8 "Marathon".
4. Trim: ASME A112.18.1; chrome plated brass supply with 6 inch goose neck swing spout, vandal proof water economy aerator with maximum 2.2 gpm flow, ADA compliant indexed lever handles. Cambridge/Delta 26T2944, Moen Model 8123 w/S0003 spout, Chicago Model 527 w/Model 317 blade handles.
5. Accessories: Chrome plated 17 gage brass P-trap with clean-out plug and arm with escutcheon, screwdriver stop, rigid supplies.

## 2.5 BATHTUBS [AND SHOWERS]

### A. Manufacturers:

1. As indicated on Drawings.

2. Bathtub: ASME A112.19.4; enameled cast iron bathtub with slip resistant surface, contoured front apron, 60 inches long, white color unless otherwise specified.
3. Bath Trim: ASME A112.18.1; concealed over rim supply with spout and indexed handles, lever operated pop-up waste and overflow.
4. Bath and Shower Trim: ASME A112.18.1; concealed shower and over rim supply with diverter spout, pressure balanced mixing valve, bent shower arm with flow control and adjustable spray ball joint showerhead with maximum 2.5 gpm flow and escutcheon, lever operated pop-up waste and overflow. Delta Model 1345-WSHDF, Symmons Model 1-215-X "Safetymix", Moen Model 8389.

## 2.6 LAVATORY INSULATION KIT

- A. Product Description: Where Lavatories are noted to be insulated for ADA compliance, furnish the following: Safety Covers conforming to ANSI A177.1 and consisting of insulation kit of molded closed cell vinyl construction, 3/16 inch thick, white or gray color, for insulating tailpiece, P-trap, valves, and supply piping. Furnish with weep hole and angle valve access covers.

# PART 3 EXECUTION

## 3.1 EXAMINATION

- A. Section 01 3000 - Administrative Requirements: Coordination and project conditions.
- B. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- C. Verify that electric power is available and of the correct characteristics.
- D. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

## 3.2 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

## 3.3 INSTALLATION

- A. Install work in accordance with all applicable codes.
- B. Install each fixture with trap, easily removable for servicing and cleaning.

- C. Provide chrome plated rigid supplies to fixtures with screwdriver stops, reducers, and escutcheons.
- D. Install components level and plumb.
- E. Install and secure fixtures in place with wall carriers and bolts.
- F. Seal fixtures to wall and floor surfaces with sealant as specified in Section 07 9005, color to match fixture.
- G. Solidly attach water closets to floor with lag screws. Lead flashing is not intended to hold fixture in place.
- H. For ADA accessible water closets, install flush valve with handle to wide side of stall.

#### 3.4 INTERFACE WITH WORK OF OTHER SECTIONS

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

#### 3.5 ADJUSTING

- A. Section 01 7000 - Execution Requirements: Testing, adjusting, and balancing.
- B. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

#### 3.6 PROTECTION

- A. Protect installed products from damage due to subsequent construction operations.
- B. Do not permit use of fixtures by construction personnel.
- C. Repair or replace damaged products before Date of Substantial Completion.

#### END OF SECTION

**SECTION 23 0001 - BASIC HVAC REQUIREMENTS - DESIGN BUILD****PART 1 GENERAL****1.1 DESCRIPTION OF WORK**

- A. This Section specifies the basic requirements for all Contractor design and installed equipment. It applies to all sections included in Division 23.
- B. Contractor shall provide complete engineering calculations and design of the HVAC systems satisfying the direction and criteria of this specification and all other supporting documents and drawings.
- C. Provide the design and all materials, labor and equipment required to install a complete and fully operational HVAC systems as indicated by the contract drawings and this specification.
- D. Contractor shall be responsible for becoming familiar with these existing conditions prior to the bid and include any and all costs associated with the modification, extension or addition to existing systems in order to meet the requirements of these documents.
- E. Contractor shall not compromise or diminish any existing building system, service or function in his execution of the work. Any such potential impacts shall be immediately brought to the attention of the Architect/Engineer.
- F. The HVAC work scope includes, but is not necessarily limited to the following:
  - 1. Install work per all applicable codes and the design criteria contained herein.
  - 2. Reroute dryer vent ducts to through roof.
  - 3. Add booster fan and lint trap to 1st floor dryers.
  - 4. Replace restroom exhaust.
  - 5. Provide laundry exhaust.
- G. Obtain and pay for all permits, licenses, fees and taxes applicable to this project as required by law.
- H. Cooperate with other trades in furnishing material and information required for installation and operation of mechanical items.
- I. Requirements for the following are included:
  - 1. Related work (other Contract Documents and specification sections) that must be combined with the requirements of this Section.
  - 2. Design performance.

3. Delivery, storage, and handling.
4. Quality assurance and standards.
5. Submittals.
6. Product quality, basic type, and finishes.
7. Design criteria.
8. Installation.
9. Inspection.
10. Cleaning, startup, and adjustments.

## 1.2 RELATED WORK

- A. This general section shall be used in conjunction with the following other specifications and related Contract Documents to establish the total requirements for the project equipment and systems:
1. Division 1 sections included in this Project specifications.
  2. The Contract.
  3. General and specific mechanical specifications and drawings included in the project.

## 1.3 DEFINITIONS

- A. “Indicated”: Refers to graphic representations, notes or schedules in the Drawings; or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents.
1. Terms such as “shown”, “noted”, “scheduled”, and “specified”, are used to notify or help the user to locate reference. Location is not limited.
- B. “Directed”: Terms such as “directed”, Requested”, “authorized”, “selected”, “approved”, “required”, and “permitted” mean directed by Architect/Engineer, approved by Architect/Engineer and similar phrases.
- C. “Approved”: When used in conjunction with Architect/Engineer's action on contract submittals, applications, requests, is limited to Architect/Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- D. “Regulations”: Includes laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of Work.
- E. “Furnish”: Means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation and similar operations.

- F. “Install”: Describes operations at Project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, supporting, isolating, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.
- G. “Provide”: Means to furnish and install.
- H. “Installer”: A contractor, or another entity engaged by the contractor, either as an employee, subcontractor, or contractor of a lower tier, to perform a particular construction activity including installation, erection, application or similar operations.
  - 1. Installers are required to be experienced in operations they are engaged to perform.
  - 2. The term “experience” means having successfully completed a minimum of three previous projects similar in scope and size to this Project and within the time frame indicated in the “Quality Assurance” section of the Specifications. In addition, it means being familiar with special requirements indicated and having complied with requirements of authorities having jurisdiction.
- I. “Project Site”: Is defined as the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project.

#### 1.4 DESIGN PERFORMANCE

- A. Compliance by the Contractor and/or Vendor with the provisions of this Specification does not relieve him of the responsibilities of furnishing equipment and materials of proper design, mechanically suited to meet operating guarantees at the specified service conditions.

#### 1.5 SUBMITTALS

- A. Product Data: Submit five complete sets of manufacturer's product data in a three ring binder for approval. Literature submitted shall clearly indicate the model number, capacity, rated operating conditions, size, weight, support requirements, electrical power requirements, utility (fuel, air, cooling water, etc.) requirements, and options furnished. Submittals shall include, but are not necessarily limited to the following;
- B. Operation and Maintenance Data: Submit three complete sets of manufacturer's literature bound in a three ring binder for approval. Data shall include installation, start-up, and maintenance instructions, parts lists, and wiring diagrams.
- C. Substitutions: System design was based upon the equipment and materials listed on the drawings and specifications herein. At contractor's option, another manufacturer's equipment of similar quality, capacity and features may be submitted for prior approval per

Section 01 3300. Prior permission to substitute does not relieve the contractor of the responsibility of including this information in the bound submittal packages.

## 1.6 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the provisions of the latest versions of the following codes, standards and specifications, except where more stringent requirements are shown or specified:
  - 1. State of Oregon "IBC".
  - 2. State of Oregon "IMC".
  - 3. State of Oregon "UPC".
  - 4. State of Oregon "IFC".
  - 5. ANSI B31.9 "Building Service Piping".
  - 6. SMACNA - "HVAC Duct Construction Standards".
  - 7. NFPA - Section 90B.
- B. Drawings: Any drawings provided are diagrammatic and show general intent, arrangement, and extent of the systems. Do not scale drawings for rough-in dimensions, nor use as shop drawings.
- C. Installer Qualifications: Company specializing in performing the work required with a minimum of five years documented experience.

## 1.7 DELIVERY, STORAGE AND PROTECTION

- A. Delivery: Deliver to site with manufacturer's labels intact and legible.
- B. Preparation for shipment:
  - 1. Each unit shall be suitably prepared for the shipment specified and for storage in accordance with manufacturer's instructions in a manner requiring no disassembly prior to operation.
  - 2. The Contractor shall be solely responsible for the adequacy of the Preparation for Shipment provisions employed with respect to materials and application.
  - 3. One complete set of Installations, Operating and Maintenance Instructions shall be packed and shipped with the equipment. This set is in addition to the sets that are to be sent directly to the Owner.
- C. Handling: Avoid damage. Comply with manufacturer's installation instruction requirements for rigging, unloading and transporting units.
- D. Storage: Inside protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

## 1.8 PROJECT CONDITIONS

- A. General: Provide products that are compatible with other portions of the work and provide products with the proper power characteristics and similar adaptations for the project.
- B. Arrangement: Arrange ductwork parallel with primary lines of the building construction and with a minimum 7 feet overhead clearance in unfinished equipment rooms where possible. Conceal all ductwork where possible unless indicated otherwise. Locate operating and control equipment properly to provide easy access for operation and maintenance. Set all equipment level or as recommended by manufacturer.
- C. Coordination: Where several elements of the work must be sequenced and positioned in order to fit the available space, prepare shop drawings showing the actual physical dimensions (at accurate scale) required for installation and submit prior to purchase/fabrication/installation of any of the elements involved in the coordination.

## 1.9 STANDARDS

- A. General: Provide all new materials and equipment, identical to apparatus or equipment in successful operation for a minimum of five years. Provide materials of comparable quality omitted here but necessary to complete the work. Maximum allowable variation from stated capacities, minus 5% to plus 10% as approved in each case.
- B. Governing Standards: The following are typical standards generally referenced in these specifications and identified by their acronym. Federal Specifications (FS), American Society for Testing Materials (ASTM), American National Standards Institute (ANSI), Manufacturer's Standardization Society of the Valve and Fitting Industry, Standard Practice (MSS SP-69), Cast Iron Soil Pipe Institute (CISPI), Underwriters Laboratory (UL) numbers are given.

## 1.10 WARRANTIES

- A. Contractor shall provide a 1-year warranty on all equipment, materials and workmanship for a period of one year from the date of owner's acceptance.

## PART 2 PRODUCTS

## PART 3 EXECUTION

### 3.1 LAYOUT AND COORDINATION

- A. Site Examination: Before starting work, carefully examine site and all Contract Drawings. Become thoroughly familiar with conditions governing work on this project. Verify all indicated elevations, building measurements, rough-in dimensions and equipment locations before proceeding with any work.
- B. Utility Locations: All on-site utilities to be new. See civil.
- C. Discrepancies: Any error, conflict or discrepancy in Specifications and/or existing conditions shall be reported immediately. Do not proceed with any questionable items of work until clarification of same has been made. Under no circumstances shall beams, girders, footings, or columns be cut for mechanical items. Casting of pipes into concrete is prohibited.

### 3.2 DESIGN CRITERIA

- A. HVAC:
  - 1. Noise levels within occupied areas of the building shall not exceed noise criteria (NC) levels of 25.
  - 2. Friction loss within the duct system shall not exceed 0.10 inches WC/100 ft.

### 3.3 EQUIPMENT REMOVAL (NOT USED)

### 3.4 MECHANICAL EQUIPMENT WIRING

- A. Provide all motor starters, control devices, and wiring complete from power source indicated on Drawings.
- B. Equipment and systems shown on the Drawings and/or specified, are based upon requirements of specific manufacturers which are intended as somewhat typical of several makes which may be approved. Provide all field wiring and/or devices necessary for a complete and operable system controls for the actual selected equipment/system.

### 3.5 INSTALLATION

- A. Provide clearance for installation of insulation and access to valves, fittings, damper actuators, etc. on pipe and duct systems.
- B. Do not operate fans for any purpose until ductwork is clean, filters in place, bearings lubricated, and the fan has been test run under observation.
- C. Locating and Positioning Equipment: Observe all Codes and Regulations and good common practice in locating and installing mechanical equipment and material so that completed installation presents the least possible hazard. Maintain recommended clearances for repair and service to all equipment.
- D. Installation shall be in accordance with the requirements of the equipment manufacturer, including special requirements for seismic restraints.

### 3.6 INSPECTION

- A. The Contractor shall inspect his work to ensure the installation and workmanship is in accordance with these specifications and acceptable industry standards for the work being done.
- B. All materials, equipment, and workmanship shall be subject to inspection at any time by the Owner. Contractor shall correct any work, materials, or equipment not in accordance with the Contract Documents.

### 3.7 SAFETY CONSIDERATIONS

- A. All equipment shall be installed with suitable access clearances that satisfy OSHA and code requirements for maintenance or removal of replaceable parts and components, and with necessary inions or flanges to perform the maintenance or removal without removing the connecting appurtenances.

### 3.8 CLEANING, START-UP, AND ADJUSTING

- A. The Contractors shall be responsible for proper operation of all systems, minor subsystems, and services provided under this section. He shall coordinate start-up procedures, calibration, and system checkout with all project managers. Any system operational problems shall be diagnosed; all correctional procedures shall be initiated as required to bring out the system into compliance with the design, and the problem then shall be rechecked to verify that the system operates normally.

- B. Thoroughly clean all parts of the installation at the completion of the work. The Contractor shall clean up and remove from the premises all refuse material, crates, and rubbish arising from his work. Remove, clean, and reinstall all filters. Belt-drive tensions and alignments shall be checked. All motors and bearings shall be lubricated in accordance with the manufacturer's service manuals prior to equipment start-up. Provide a lubrication schedule for every item of equipment furnished under this section. The schedule shall include the type of lubricant and the application frequency.

**END OF SECTION**

**SECTION 23 3423 - HVAC POWER VENTILATORS****PART 1 GENERAL****1.1 SECTION INCLUDES**

- A. Ceiling exhaust fans.
- B. Duct exhaust fans.
- C. In-line exhaust fans.

**1.2 RELATED REQUIREMENTS**

- A. Section 22 0513 - Common Motor Requirements for Plumbing Equipment.
- B. Section 23 0513 - Common Motor Requirements for HVAC Equipment.
- C. Section 23 0548 - Vibration and Seismic Controls for HVAC Piping and Equipment.
- D. Section 23 3300 - Air Duct Accessories: Backdraft dampers.
- E. Section 26 2717 - Equipment Wiring: Electrical characteristics and wiring connections.

**1.3 REFERENCE STANDARDS**

- A. AMCA 99 - Standards Handbook; Air Movement and Control Association International, Inc.; 2010.
- B. AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating; Air Movement and Control Association International, Inc.; 2007 (ANSI/AMCA 210, same as ANSI/ASHRAE 51).
- C. AMCA (DIR) - Products Licensed Under AMCA International Certified Ratings Program; Air Movement and Control Association International, Inc.
- D. AMCA 300 - Reverberant Room Method for Sound Testing of Fans; Air Movement and Control Association International, Inc.; 2008.
- E. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; Air Movement and Control Association International, Inc.; 1990.

- F. NFPA 96 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; National Fire Protection Association; 2011.
- G. UL 705 - Power Ventilators; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

#### 1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements.
- C. Manufacturer's Instructions: Indicate installation instructions.
- D. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Fan Belts: Two sets for each individual fan.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

### PART 2 PRODUCTS

#### 2.1 POWER VENTILATORS - GENERAL

- A. Performance Ratings: Determined in accordance with AMCA 210 and bearing the AMCA Certified Rating Seal.
- B. Sound Ratings: AMCA 301, tested to AMCA 300, and bearing AMCA Certified Sound Rating Seal.

- C. Fabrication: Conform to AMCA 99.
- D. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
- E. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- F. Kitchen Range Hood Exhaust Fans: Comply with requirements of NFPA 96.

## 2.2 ROOF EXHAUSTERS

- A. Manufacturers:
  1. Greenheck; Model G or GB: [www.greenheck.com](http://www.greenheck.com).
  2. Carnes; Model Series VE: [www.carnes.com](http://www.carnes.com).
  3. Loren Cook Company; Model Series AC: [www.lorencook.com](http://www.lorencook.com).
  4. JenCoFan; Model RED or DB: [www.jencofan.com](http://www.jencofan.com).
  5. PennBarry; Model Domex: [www.pennbarry.com](http://www.pennbarry.com).
- B. Fan Unit: V-belt or direct driven as indicated, with spun aluminum housing; resilient mounted motor; 1/2 inch (13 mm) mesh, 0.62 inch (1.6 mm) thick aluminum wire birdscreen; square base to suit roof curb with continuous curb gaskets.
- C. Roof Curb: 12 inch (300 mm) high self-flashing of galvanized steel with continuously welded seams, built-in cant strips, insulation and curb bottom, interior baffle with acoustic insulation, curb bottom, and factory installed nailer strip.
- D. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor and wall mounted multiple speed switch.
- E. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked, and line voltage motor drive, power open, spring return.
- F. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

## 2.3 WALL EXHAUSTERS

- A. Manufacturers:

1. As indicated on Drawings.
- B. Fan Unit: V-belt or direct driven with spun aluminum housing; resiliently mounted motor; 1/2 inch (13 mm) mesh, 0.062 inch (1.6 mm) thick aluminum wire bird screen.
- C. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor, and wall mounted multiple speed switch.
- D. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked, and line voltage motor drive, power open, spring return.
- E. Sheaves: For V-belt drives, provide cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

#### 2.4 CABINET AND CEILING EXHAUST FANS (SMALL BATH EXHAUSTERS)

- A. Manufacturers:
  1. As indicated on Drawings.
  2. PennBarry; Model Zephyr: [www.pennbarry.com](http://www.pennbarry.com).
- B. Construction:
  1. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with 1/2 inch acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge.
  2. Disconnect Switch: Cord and plug in housing for thermal overload protected motor and wall mounted switch.
  3. Grille: Aluminum with baked white enamel finish.
  4. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.
- C. Electrical Characteristics and Components:
  1. Electrical Characteristics: In accordance with Division 26.
  2. Motors: In accordance with Section 22 0513/23 0513. Type: NEMA MG1.
  3. Controls: Wall switch.
  4. Disconnect Switch: Factory mount disconnect switch on equipment.

## 2.5 IN-LINE EXHAUST FANS (BI WHEEL WITH HIGH VOL/STATIC)

### A. Manufacturers:

1. Greenheck; Model Series SQ/BSQ: [www.greenheck.com](http://www.greenheck.com).

### B. Construction:

1. Centrifugal Fan Unit: V-belt or direct driven backward incline wheel with galvanized steel housing and support lugs, lined with 1/2 inch acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge.
2. Disconnect Switch: Cord and plug in housing for thermal overload protected motor and wall mounted switch.
3. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

### C. Electrical Characteristics and Components:

1. Electrical Characteristics: In accordance with Division 26.
2. Motors: In accordance with Section 22 0513/23 0513. Type: NEMA MG1.
3. Controls: Wall switch.
4. Disconnect Switch: Factory mount disconnect switch on equipment.

## PART 3 EXECUTION

### 3.1 INSTALLATION

#### A. Install in accordance with manufacturer's instructions.

#### B. Secure roof exhausters with stainless steel lag screws to roof curb.

#### C. Extend ducts to roof exhausters into roof curb. Counterflash duct to roof opening.

#### D. Hung Cabinet Fans:

1. Install fans with resilient mountings and flexible electrical leads. Refer to Section 23 0548.
2. Install flexible connections specified in Section 23 3300 between fan and ductwork. Ensure metal bands of connectors are parallel with minimum one inch (25 mm) flex between ductwork and fan while running.

#### E. Provide sheaves required for final air balance.

- F. Install backdraft dampers on inlet to roof and wall exhausters.
- G. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.

**END OF SECTION**

**SECTION 31 10 00 – SITE CLEARING****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Temporary erosion- and sedimentation-control measures.

**1.2 MATERIAL OWNERSHIP**

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

**1.3 PROJECT CONDITIONS**

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.
- C. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- D. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- E. The following practices are prohibited within protection zones:
1. Storage of construction materials, debris, or excavated material.
  2. Parking vehicles or equipment.
  3. Foot traffic.
  4. Erection of sheds or structures.
  5. Impoundment of water.
  6. Excavation or other digging unless otherwise indicated.
  7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Earth Moving."
  - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

**PART 3 - EXECUTION****3.1 PREPARATION**

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.
  - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

**3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

**3.3 TREE AND PLANT PROTECTION**

- A. General: Protect trees and plants remaining on-site according to requirements in Division 01 Section "Temporary Tree and Plant Protection."
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

**3.4 CLEARING AND GRUBBING**

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
  - 1. Grind down stumps and remove roots, obstructions, and debris to a depth of 18 inches below exposed subgrade.
  - 2. Use only hand methods for grubbing within protection zones.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
  - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

**3.5 TOPSOIL STRIPPING**

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 4 inches in a manner to prevent intermingling with underlying subsoil or other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

**3.6 SITE IMPROVEMENTS**

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

**3.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS**

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 31 10 00

**SECTION 31 20 00 – EARTH MOVING****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Preparing subgrades for walks, pavements, turf and grasses and plants.
2. Excavating and backfilling for buildings and structures.
3. Base course for concrete walks and pavements.
4. Base course for asphalt paving.

**1.2 DEFINITIONS****A. Backfill:** Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

**B. Base Course:** Aggregate layer placed between the subbase course and hot-mix asphalt paving.**C. Bedding Course:** Aggregate layer placed over the excavated subgrade in a trench before laying pipe.**D. Borrow Soil:** Satisfactory soil imported from off-site for use as fill or backfill.**E. Drainage Course:** Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.**F. Excavation:** Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

**G. Fill:** Soil materials used to raise existing grades.**H. Structures:** Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.**I. Subgrade:** Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

- J. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

#### 1.3 QUALITY ASSURANCE

- A. Preexcavation Conference: Conduct conference at Project site.

#### 1.4 PROJECT CONDITIONS

- A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.
- B. Do not commence earth moving operations until plant-protection measures are in place.

### PART 2 - PRODUCTS

#### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.
1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.
- E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.
- F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- G. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

**PART 3 - EXECUTION****3.1 PREPARATION**

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

**3.2 EXCAVATION, GENERAL**

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
  - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

**3.3 EXCAVATION FOR WALKS AND PAVEMENTS**

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

**3.4 SUBGRADE INSPECTION**

- A. Proof-roll subgrade below the pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

**3.5 UNAUTHORIZED EXCAVATION**

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.
  - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

**3.6      STORAGE OF SOIL MATERIALS**

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

**3.7      SOIL FILL**

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
  - 1. Under grass and planted areas, use satisfactory soil material.
  - 2. Under walks and pavements, use satisfactory soil material.
  - 3. Under steps and ramps, use engineered fill.

**3.8      SOIL MOISTURE CONTROL**

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

**3.9      COMPACTION OF SOIL BACKFILLS AND FILLS**

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
  - 1. Under pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
  - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
  - 3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.

**3.10 GRADING**

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
  - 1. Turf or Unpaved Areas: Plus or minus 1 inch.
  - 2. Walks: Plus or minus 1 inch.
  - 3. Pavements: Plus or minus 1/2 inch.

**3.11 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS**

- A. Place base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place base course under pavements and walks as follows:
  - 1. Shape base course to required crown elevations and cross-slope grades.
  - 2. Place base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
  - 3. Compact base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

**3.12 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

**3.13 PROTECTION**

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### 3.14 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 31 20 00

**SECTION 32 12 16 – ASPHALT PAVING****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Hot-mix asphalt patching.
2. Hot-mix asphalt paving.
3. Hot-mix asphalt overlay.
4. Pavement-marking paint.
5. Parking Bumpers.
6. Asphalt surface treatments.

**B. Related Sections:**

1. Division 31 Section "Earth Moving" for aggregate subbase and base courses and for aggregate pavement shoulders.

**1.2 SUBMITTALS****A. Product Data:** For each type of product indicated. Include technical data and tested physical and performance properties.

1. Job-Mix Designs: For each job mix proposed for the Work.

**B. Material Certificates:** For each paving material, from manufacturer.**1.3 QUALITY ASSURANCE****A. Manufacturer Qualifications:** A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of state in which Project is located.**B. Regulatory Requirements:** Comply with materials, workmanship, and other applicable requirements of ODOT for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

**C. Preinstallation Conference:** Conduct conference at Project site.

#### 1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
  - 1. Tack Coat: Minimum surface temperature of 60 deg F.
  - 2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
  - 3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F for water-based materials, and not exceeding 95 deg F.

#### 1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
  - 1. Prime Coat: Minimum surface temperature of 60 deg F.
  - 2. Tack Coat: Minimum surface temperature of 60 deg F.
  - 3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
  - 4. Asphalt Base Course: Minimum surface temperature of 40 deg and rising at time of placement.
  - 5. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

### PART 2 - PRODUCTS

#### 2.1 AGGREGATES

- A. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
- B. Fine Aggregate: ASTM D 1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
- C. Mineral Filler: ASTM D 242, rock or slag dust, hydraulic cement, or other inert material.

#### 2.2 ASPHALT MATERIALS

- A. Asphalt Binder: AASHTO M 320 or AASHTO MP 1a, PG 64-22.
- B. Tack Coat: ASTM D 977 emulsified asphalt, or ASTM D 2397 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

## 2.3 AUXILIARY MATERIALS

- A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.
- B. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 3 minutes.
  - 1. Color: As indicated.

## 2.4 MIXES

- A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by ODOT and complying with the following requirements:
  - 1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
  - 2. Surface Course:  $\frac{1}{2}$ " dense, Level 2 HMAC.
- B. Emulsified-Asphalt Slurry: ASTM D 3910, Type 1.

## 2.5 PARKING BUMPERS

- A. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.
  - 1. Dowels: Galvanized steel, 3/4-inch diameter, 10-inch minimum length.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- B. Proceed with paving only after unsatisfactory conditions have been corrected.

## 3.2 PATCHING

- A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

- B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd..
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- C. Patching: Fill excavated pavements with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

### 3.3 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
- C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

### 3.4 PLACING HOT-MIX ASPHALT

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
  - 1. Spread mix at minimum temperature of 250 deg F.
  - 2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

### 3.5 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
  - 1. Clean contact surfaces and apply tack coat to joints.
  - 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
  - 3. Offset transverse joints, in successive courses, a minimum of 24 inches.
  - 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AIMS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

### 3.6 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
  - 1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
  - 1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

**3.7 INSTALLATION TOLERANCES**

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
  - 1. Base Course: Plus or minus 1/2 inch.
  - 2. Surface Course: Plus 1/4 inch, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
  - 1. Surface Course: 1/8 inch.

**3.8 SURFACE TREATMENTS**

- A. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D 3910 and allow to cure.
  - 1. Roll slurry seal to remove ridges and provide a uniform, smooth surface.

**3.9 PAVEMENT MARKING**

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
- B. Allow paving to age for 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

**3.10 PARKING BUMPER INSTALLATION**

- A. General: Install wheel stops according to manufacturer's written instructions unless otherwise indicated.
- B. Install wheel stops in bed of adhesive before anchoring.
- C. Securely anchor wheel stops to pavement with hardware in each preformed vertical hole in wheel stop as recommended in writing by manufacturer.

**3.11 FIELD QUALITY CONTROL**

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Replace and compact hot-mix asphalt where core tests were taken.
- C. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

**3.12 DISPOSAL**

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

END OF SECTION 32 12 16

**SECTION 32 13 13 – CONCRETE PAVING****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Curbs and gutters.
  - 2. Walks.

**1.2 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Other Action Submittals:
  - 1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

**1.3 QUALITY ASSURANCE**

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. ACI Publications: Comply with ACI 301 unless otherwise indicated.

**PART 2 - PRODUCTS****2.1 CONCRETE MATERIALS**

- A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
  - 1. Portland Cement: ASTM C 150, gray portland cement Type I.
- B. Normal-Weight Aggregates: ASTM C 33, uniformly graded. Provide aggregates from a single source.
- C. Water: Potable and complying with ASTM C 94/C 94M.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

## 2.2 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry or cotton mats.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
- F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B, dissipating.

## 2.3 RELATED MATERIALS

- A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork in preformed strips.

## 2.4 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301, with the following properties:
  - 1. Compressive Strength (28 Days): 3000 psi.
  - 2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50.
  - 3. Slump Limit: 4 inches, plus or minus 1 inch.
  - 4. Air Content: 4-1/2 percent plus or minus 1.5 percent.
- B. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

## 2.5 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

# PART 3 - EXECUTION

## 3.1 EXAMINATION AND PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

## 3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

### 3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

### 3.4 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, to match jointing of existing adjacent concrete paving.
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

### 3.5 CONCRETE PLACEMENT

- A. Moisten subbase to provide a uniform dampened condition at time concrete is placed.
- B. Comply with ACI 301 requirements for measuring, mixing, transporting, placing, and consolidating concrete.
- C. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- D. Screed paving surface with a straightedge and strike off.
- E. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

### 3.6 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.

- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

### 3.7 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture-retaining-cover curing, curing compound, or a combination of these.

### 3.8 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
  1. Elevation: 3/4 inch.
  2. Thickness: Plus 3/8 inch, minus 1/4 inch.
  3. Surface: Gap below 10-foot-long, unleveled straightedge not to exceed 1/2 inch.
  4. Joint Spacing: 3 inches.
  5. Contraction Joint Depth: Plus 1/4 inch, no minus.
  6. Joint Width: Plus 1/8 inch, no minus.

### 3.9 REPAIRS AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.
- B. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- C. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13

**SECTION 32 8410 – DESIGN-BUILD PLANTING IRRIGATION****PART 1 - GENERAL****1.1 WORK INCLUDES**

- A. This Section includes piping, valves, sprinklers, specialties, controls, and wiring for automatic-control irrigation system.
- B. Related sections:
  - 1. Division 31 Section “Earth Moving” for utility trench excavation, backfilling, compacting, and grading requirements.
  - 2. Division 32 Section “Plants” for tree and shrub planting.
  - 3. Division 32 Section “Lawn and Grasses” for seeding of lawns and grasses.

**1.2 DEFINITIONS**

- A. Mainline: Piping downstream from irrigation point of connection to valves. Piping is under constant pressure.
- B. Lateral Line: Piping downstream from control valves to sprinklers, outlets, and drain valves. Piping is not under constant pressure.
- C. The following are industry abbreviations for plastic materials:
  - 1. PE: Polyethylene plastic.
  - 2. PP: Polypropylene plastic.
  - 3. PVC: Polyvinyl chloride plastic.
  - 4. TFE: Tetrafluoroethylene plastic.

**1.3 SITE CONDITIONS**

- A. Meet with Owner’s Representative Owner’s maintenance staff on site to review existing irrigation system and scope of work prior to demolishing or modifying any parts of the system.

**1.4 PERFORMANCE REQUIREMENTS**

- A. Design 100 percent water-coverage irrigation system for lawns and exterior plants indicated on the Drawings.
- B. Minimum Working Pressures: The following are minimum pressure requirements for piping, valves, and specialties, unless otherwise indicated:

1. Irrigation Main Piping: 250 psi.
2. Lateral Line Piping: 200 psi.
3. Lateral Line Piping On-grade: 250 psi.
4. Drain Line Piping: 200 psi.

## 1.5 SUBMITTALS

- A. Shop Drawings: Submit design-build irrigation plan for approval by Owner's Representative prior to construction. Show the following information on the drawing:
1. Irrigation system piping, including plan layout, and locations, types, sizes, capacities, and flow characteristics of irrigation system piping components.
  2. Static water pressure and flow in gallons per minute at available source.
  3. Piping layout to water sources. Coordinate to provide required water services.
  4. Water meters, backflow preventers, valves, piping, sprinkler heads and devices, accessories, controls, and wiring.
  5. Location of sleeves under pavement,
  6. Plant and landscaping features, and site structures.
  7. Schedule of equipment to be used.
  8. Areas of sprinkler spray and overspray.
- B. Controller Shop Drawings: Provide shop drawing of irrigation controller panel showing all equipment to be supplied as part of pre-assembled irrigation controller assembly. Provide one shop drawing for each unique controller panel configuration.
- C. The following minimum design criteria shall be met:
1. Design irrigation system to comply with the irrigation product and performance requirements of these specifications.
  2. Head layout to provide 100 percent overhead irrigation, head-to-head coverage, for both lawn and planting areas as indicated on the Drawings.
  3. Irrigation system for lawn areas shall be capable of applying minimum 1 inch of water per week.
  4. Irrigation system for shrubs shall be capable of applying maximum evapotranspiration rates for the specified plant materials.
  5. Minimum pressure at furthest head from remote control valve: not less than the minimum operating pressure of the outlet.
  6. Velocity in pipes not to exceed 5 feet per second.
  7. Irrigation System shall be capable of irrigating the entire site between 10:00 P.M. and 6:00 A.M.
  8. Sprinkler heads in an irrigation zone shall be from the same manufacturer, model and nozzles type.
  9. Sprinkler nozzles shall have matched precipitation rate within an irrigation zone. Do not mix different heads on a valve, or operate valves together where heads have a precipitation rate that varies more than 10 percent.
  10. Sprinkler spacing: Use manufacturer's maximum triangular or square spacing, low angle trajectory allowing for an 8 mile per hour wind, but do not exceed 55 percent of diameter of spray for triangular spacing and 50 percent of spray for square spacing.

11. Irrigation system shall be designed so that planting areas and lawn areas are on separate zones to facilitate the specific watering requirements of each plant type.
  12. The irrigation system shall be gravity drainable and have drain valves to facilitate gravity drainage.
  13. Planting areas with different exposures shall be valved separately.
  14. See Drawings for irrigation installation details.
- D. Materials List: Within 30 days after award of Contract, and before any irrigation system materials are delivered to the job site, submit to the Owner's Representative a complete list of all irrigation system materials proposed to be furnished and installed. Submit catalog data, including manufacturer's name and catalog number, model number, specifications, brochures, or other data giving complete information about each item. Include pressure ratings, rated capacities, and settings of selected models for the following:
1. General-duty valves.
  2. Specialty valves.
  3. Control-valve boxes.
  4. Sprinklers.
  5. Irrigation specialties.
  6. Control wires and cables. Include splice kits [and conduit].
  7. Water regulators.
  8. Water hammer arresters.
  9. Combination Air Release and Air and Vacuum Valves
- E. Record Drawings: Provide Record Drawings illustrating actual as-built locations for all irrigation equipment per Division 01 Section "Closeout Submittals."
1. During the course of installation, carefully show in red line on a print of the irrigation system Drawings, all changes made to the irrigation system during installation. This drawing to be labeled "Record Copy". Make available for inspection. Do not use for construction.
  2. Upon completion of the work, transfer all changes to a complete set of the construction drawings. Changes to work drawn to be cleanly erased and new work professionally drafted in proper locations. Dimension and note clearly all underground work located horizontally and vertically. Clearly mark each sheet with the words "As-Built" and date.
  3. Submit As-Built Drawings for approval. If Drawings are not clear, or information is not complete, revise and resubmit for approval. Project will not be complete until As-Built Drawings are submitted and accepted by Owner's Representative.
  4. Submit As-Built Digital Drawings after hard-copy drawings are approved. Digital drawings shall be in Auto CAD release 14 format or newer and copied onto a compact disk or zip disk. Submit at time of final examination for irrigation system.
- F. Tools: Submit to the Owner two sets each, as appropriate, of controller keys, quick coupler operating keys with hose swivels, gate valve keys, air compressor valve keys, valve box keys, wrenches for removal and adjustment of type of sprinkler head, and unique tools or devices needed to access, operate, adjust or maintain the system. Submit at time of final examination for irrigation system.
- G. Zone Map: Submit a laminated irrigation plan sized to fit inside controller enclosure indicating by varying colors the area of coverage for each control valve. Showing which

valves are activated by each station on the controller. Show the location and valve number of each valve and the corresponding controller station number. The valve numbers shall be the valve numbers shown on the As Built Drawings. The Zone Map may be made from a cropped copy of the As-Built Drawings. Submit to the Owner's Representative at time of final inspection for irrigation.

- H. Guide Manuals: Submit operating and maintenance guides for the entire system and for each piece of equipment in the system. Instructions for system weatherization are to be included. Submit to the Owner's Representative at the time of the final examination of irrigation system.
- I. Irrigation Schedule: Submit six 8-1/2 inches by 11 inches copies of an irrigation schedule. On the schedule, indicate the day(s) of the week each zone is watered, and the duration each zone is watered (in minutes).
  - 1. Provide Irrigation schedule based on results of Irrigation Water Audit.
- J. Testing Certificates:
  - 1. Certification of backflow devices.
  - 2. Hydrostatic pressure testing.

## 1.6 QUALITY ASSURANCE

- A. Provide at least one person who shall be present at all times during execution of this portion of the Work, and who is thoroughly familiar with the type of materials being installed and the manufacturer's recommended methods of installation, and who shall direct all work performed under this Section.
- B. Except where more stringent requirements are specified, conform to the "Uniform Plumbing Code" as adopted and modified by the State of Oregon and all legally constituted authorities having jurisdiction. If more restrictive than those specified herein, notify the Owner's Representative prior to starting work.
- C. All materials and equipment in the system to be new and be brands and types as shown in the Drawings or as specified herein, or as accepted by the Owner's Representative.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store materials in areas designated by the Owner.
- C. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

- D. Use all means necessary to protect irrigation system materials from damage, theft and vandalism before, during, and after installation.
- E. In the event of damage, immediately make all repairs and replacements necessary to the satisfaction of the Owner's Representative, and at no additional cost to the Owner.

#### 1.8 PROJECT CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
  - 1. Notify Owner no fewer than two days in advance of proposed interruption of water service.
  - 2. Do not proceed with interruption of water service without written permission of the Owner.
- B. Locate and identify, with visible marking, existing underground utilities in the areas of work. Call Northwest Utility Notification Center (800) 424-5555. If utilities are to remain in place, provide adequate means of protection during excavation operations.
- C. Should uncharted piping or other utilities be encountered during excavation, consult the utility owner immediately for directions. Cooperate with the Owner and public and private utility companies in keeping their respective services and facilities in operation. Repair damaged utilities to the satisfaction of the utility owner. The cost of repairing charted utilities shall be paid by the Contractor at no additional cost to the Owner.
- D. Protect buildings, equipment, utilities, sidewalks, paving, reference points, monuments, and markers on the site. Take extreme caution when trenching at adjacent to aggregate base courses and around existing trees and their root systems. No root cutting is allowed without prior approval. Protect adjacent properties. Protect work by others. Replace or repair damaged items at no cost to the Owner and to the approval of the Owner's Representative.
- E. Coordinate with other trades affecting or affected by Work of this Section.

#### 1.9 WARRANTY

- A. Warranty work and materials in writing for one year from the date of Final Acceptance, against defective workmanship and materials. All failures in workmanship or materials will be repaired at no additional cost to the Owner immediately after notification by the Owner's Representative.
- B. Contractor shall be responsible for maintaining system and protecting it from all damage until date of Final Acceptance at no additional cost to Owner. This shall include damage caused by vandalism or adverse weather conditions.

**1.10 ONE-YEAR CORRECTION PERIOD**

- A. Repair any settling of backfilled trenches occurring during the one-year correction period at no additional cost to Owner. Include complete restoration of all damaged planting, pavement, and other improvements of any kind.

**1.11 SYSTEM COVERAGE**

- A. The system is designed to provide full coverage, less plant interference, on all planting areas. It is anticipated that Contractor will exercise professional judgment in location, height, slope of sprinkler heads without measurably changing the system design. No changes shall be made in the approved Shop Drawings without the prior approval of Owner's Representative.

**1.12 SYSTEM FAMILIARIZATION**

- A. Upon acceptance of the system by Owner's Representative, Contractor shall provide the necessary keys and other tools necessary to operate, drain, and activate the system. Contractor shall train Owner's maintenance personnel and provide written instructions to ensure that the system operation, maintenance, and winterizing can continue after departure of the Contractor. Contractor will be liable for all damages or losses resulting from failure to comply with the provisions of this Article.

**PART 2 - PRODUCTS****2.1 PIPES, TUBES AND FITTINGS**

- A. Steel Pipe: ASTM A-53, Schedule 40, Type S or E, Grade A or B, galvanized with threaded ends.
  1. Steel Pipe Nipples: ASTM A-733, made of ASTM A-53 or ASTM A-106, Schedule 40, galvanized, seamless steel pipe with threaded ends.
  2. Malleable-Iron Unions: ASME B16.39, Class 150, hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface, and female threaded ends.
  3. Gray-Iron Threaded Fittings: ASME B16.4, Class 125, galvanized, standard pattern.
  4. Cast-Iron Flanges: ASME B16.1, Class 125.
  5. Cast-Iron Flanged Fittings: ASME B16.1, Class 125, galvanized.
- B. Hard Copper Tube: ASTM B 88, Type K, water tube, drawn temper.
  1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper solder-joint fittings. Furnish wrought-copper fittings if indicated.
  2. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.
- C. Brass Pipe: ASTM B584 Alloy C84400 Standard Specifications for copper alloy sand casting for general applications.;

1. Brass Pipe Nipples: ASTM B-43, seamless red brass pipe with threaded ends.
2. Brass Pipe Fittings: ANSI B-16.15 cast copper alloy threaded fittings.
3. Brass Unions: ANSI B-16.15, Federal Specification WW-U-516 for Type III, Class A and Class B cast copper alloy threaded unions.

D. PVC Pipe, General:

1. Material used in the manufacture of the pipe shall be domestically produced rigid PVC 1120 compound, Type I Grade I, with Cell Classification of 12454 as defined in ASTM D-1784.
2. Pipe shall continuously bear the National Sanitation Foundation seal of approval for potable water usage and comply with the following requirements for product marking ASTM D-2241, D-1785 and D-2665 as applicable. Markings shall include: manufacturers name; nominal pipe size; outside diameter system; material designation code; applicable thermoplastic pipe Standard Dimension Ratio designation code (SDR number) or pipe schedule, and corresponding pressure rating in psi for water at 73 degrees Fahrenheit.
3. Belled-end pipe shall have tapered sockets to create an interference-type fit, which meet or exceed the dimensional requirements and the minimum socket length for pressure-type sockets as defined in ASTM D-2672.
4. Pipe sizes 1/2 inch and 1-1/4 inch are not allowed.

E. PVC Mainline (Buried 24 inches below grade): ASTM D-1785, Schedule 40

F. PVC Mainline (Buried less than 24-inch below grade and below pedestal paver systems): ASTM D-1785, Schedule 80.

G. PVC Lateral Line, Pressure-Rated Pipe: ASTM D-2241, SDR 21, 200 psi minimum

H. PVC Nipples and Fittings:

1. PVC Socket Fittings, Schedule 40: ASTM D-2466; and Schedule 80: ASTM D 2467.
2. PVC Pipe Nipples: ASTM D-1785, PVC 1120 compound, Schedule 80.
3. PVC Threaded Fittings, Schedule 80: ASTM D-2464.

I. PE Tubing Fittings:

1. All insert barbed fittings shall be constructed of molded, ultra-violet-resistant, brown colored plastic having a nominal inside dimension (I.D.) of 0.54 inch. Each fitting shall have a minimum of two ridges or barbs per outlet. All fittings shall be of same manufacturer as drip tubing and shall be available in one of the following end configurations:
  - a. Barbed insert fittings
  - b. Male pipe threads (MPT) with barbed insert fittings; or
  - c. Female pipe threads (FPT) with barbed insert fittings.

- J. Sleeves: PVC pipe under all paving, sized to accommodate required sizes and numbers of pipes and wires, 6-inch minimum diameter, in no case less than twice the diameter of the pipe being sleeved.
1. Schedule 40 PVC, ASTM D-1785 or Plastic Sewer Pipe ASTM D-3034, SDR-35, PVC conforming to ASTM D-1784, N.S.F. approved pipe.

## 2.2 JOINING MATERIALS

- A. Copper Pipe Solder:
1. Silver solder, 45 percent silver, 15 percent copper, 16 percent, zinc, 24 percent cadmium and solidus at 1125 degrees Fahrenheit, and liquids at 1145 degrees Fahrenheit; conforming to ASTM B206-52T and Federal Specification QQ-B 00655.
- B. Pipe Solvent Cement:
1. PVC Solvent Cement ASTM D-2564.
  2. 'Weld-On' I.P.S. 705 for pipe sizes up to 2 inch diameter.
  3. 'Weld-On' I.P.S. 711 cement with P70 primer for pipe sizes 2-1/2 inches and larger.
- C. PVC Primer:
1. ASTM F-656, 'Weld-On' I.P.S. P-70.
- D. PVC Cleaner:
1. SCAQMD 1168, Low V.O.C, 'Weld-On' I.P.S. C-65
- E. Field-Assembled Swing Joints:
1. For Rotors and Quick Couplers: Schedule 40 PVC fittings and Schedule 80 PVC nipples as shown on the Drawings. Size to match inlet size of rotor head or quick coupler. Use is acceptable for all flows.
- F. Pre-fabricated Swing Joint Assemblies:
1. Class 315 PVC construction with leak-proof "O-ring" seals. Size to match inlet size of pop-up rotor head or quick coupler. Use for flows greater than or equal to 4 gpm. Length as required. 'Lasco' triple swing joint or equal.
  2. Flexible PE swing pipe flexible riser assembly: Minimum 18-inch length polyethylene piping with black Marlex spiral barb fittings. Use for flows under 4 gpm. 'RainBird' swing assemblies or equal.

## 2.3 GENERAL-DUTY VALVES

- A. Manufacturers:
1. Apollo: Product Isolation Valve 70 Series.

2. Nibco: Product, Brass Gate Valve, T-113.
  3. Champion: Product, Remote Control Isolation Valve, 300RS, valve size.
  4. Nibco: Product, Drain Valve, T-311-Y.
  5. Substitutions: See Division 01 Section "Product Requirements."
- B. Isolation Valve: Full port ball valve with threaded ends, minimum 400 PSI CWP rating, forged brass and cast bronze bodies and end pieces RPTFE seats and seals, blow-out proof stem design, chrome-plated brass ball, with stainless steel handle. Size same as pipe on which it is installed.
- C. Gate Valve: Brass body construction, full-port, with threaded ends, non-rising stem, 150 psi. Size same as pipe on which it is installed.
- D. Isolation Valve For Electric Control Valve Assembly: unionized brass, angle-pattern, globe valve with screw-in bonnet, integral seat, 200 PSI CWP rating, conforming to MSS SP-80; size to be same as remote control valve..
- E. Drain Valves (Mainline Drain Valves): bronze, angle-pattern, globe valve with screw-in bonnet, integral seat, 200 PSI CWP rating, conforming to MSS SP-80, 1 inch minimum. Straight-pattern for roof garden installations, and angle-pattern for on-grade installations.

## 2.4 SPECIALTY VALVES

- A. Manufacturers:
1. RainBird: Product, Quick Coupling Valve, 44LRC.
  2. RainBird: Product, Pressure-Regulating, Remote Control Valve, PESB-PRS-D Series.
- A. Quick Coupling Valve: ¾ inch double-track, key lug, locking, locking rubber cover, two-piece body, with corresponding key and swivel hose ell.
- B. Remote Control Valves: Glass-filled nylon reinforced plastic globe valve, normally closed, slow-closing, one-piece solenoid, with pressure regulating module, flow control, and self-cleaning screen for dirty water applications.
- C. Pressure Regulating Valve: Bronze body construction, adjustable from 25-75 psi.
- D. Pipe Supports for Master Valve and Backflow Preventer: Size and number as required.

## 2.5 VALVE BOXES And VAULTS

- A. Manufacturers:
1. 'Carson Brooks', 'Pentek', 'RainBird' or equal: Product, Plastic Valve Boxes.
- B. Valve Boxes: HDPE plastic boxes with locking top and 6-inch extensions to facilitate required depth of installation where applicable. Lids shall be black green color unless otherwise noted.

1. Electric valves shall be installed in jumbo boxes.
2. Electric drip system valves shall be installed in jumbo [standard] boxes.
3. Isolation valves shall be installed in standard boxes.
4. Quick couplers shall be installed in 10-inch round valve boxes.
5. Drain valves shall be installed in 5-1/4 inches round adjustable valve boxes.

C. Valve Box and Vault Accessories:

1. Drain Rock: 3/4 inch to 1/4 inch clean and washed pea gravel, no fines.
2. Filter Fabric: Woven or non-woven geotextile for use in separating drain rock from subgrade in valve box and vault installations while providing adequate drainage.
3. Brick or Concrete Block Supports: (2)-4-inch by 8-inch by 4-inch bricks or (1) 8-inch by 8-inch by 4-inch concrete paver at each corner of valve box.
4. Pipe Supports for Master Valve and Backflow Preventer: Standon Pipe Support, size as required.

2.6 OUTLETS

A. Manufacturers:

1. RainBird: Product Pop-up Spray Head with Pressure Regulating 1800-PRS, and matched precipitation rate nozzles, or equal.
2. RainBird: Product, Pop-up Lawn Rotors, 3500 Series, or equal.
3. RainBird: Product, Pop-up Shrub Rotors, 5000 Series, or equal.
4. Hunter: Product, Pop-up Lawn Rotors, I-20 Series, or equal.
5. Hunter: Product, Pop-up Shrub Rotors, I-20 Series, or equal.
6. RainBird: Product, Bubbler System, Root Watering System, RWS, or equal.

B. Sprinkler Heads: Underground, closed case, rotary heads and pop-up spray heads, sufficient to apply designed precipitation rates. At the toe of slopes and low points in the circuit, install sprinkler bodies with in-line check valves to prevent low head drainage.

1. New and existing lawn areas: minimum 6-inch pop-up height.
2. New or existing planting areas: minimum 12-inch pop-up height.
3. Slopes 1:2 or steeper: minimum 12-inch pop-up height.

C. Bubbler System: Assembly consisting of a bubbler, internal plumbing, and swing joint inside a plastic mesh canister with a locking plastic grate. Designed for irrigation of trees in tree wells, and trees and shrubs on an individual basis.

2.7 AUTOMATIC-CONTROL SYSTEM

A. Supplier

1. Product, Automatic Control System: Unite Pipe and Supply Company, Contact Kelly Duncan 503-788-8813, or equal.

B. Manufacturers:

1. Paige Electric: Product, Electrical Control Wire, or equal.
2. 3M: Product, Control Wire Connectors: Models: DBY and DBR, or equal.

C. Electrical Control Wire and Accessories:

1. Single-strand copper, UL approved for direct burial, AWG-UF type, sized per manufacturer's recommendations, No. 14 gauge minimum.
2. Use red wire for each control valve and white for common. Reserve yellow for spare wires, and blue for tracer wires.
3. Control Wire Connectors: Water-proof wire connectors, direct-burial with sealant.
4. Communication cable (for flow sensor): Bundled cable consisting of 19 AWG, 6-pair twisted insulated wire, with corrugated aluminum tape shield, and black polyethylene jacket, direct-burial.
5. Communication Cable Splice Kit: Water-proof splice kit with sealant for multi-strand cable.
6. Electrical Conduit and Fittings: High-impact Schedule 40 PVC C-2000 compound, UL-approved, gray color, size as required. Solvent-weld fittings.

2.8 OTHER MATERIAL

A. Manufacturers:

1. Terra Tape: Product, Detectable Warning Tape, or equal.
2. Christy (T. Christy Enterprises): Product, Valve Identification Tags or equal.
3. 3M: Product, Control Wire Numbering Labels, or equal.
4. Christy Concrete Products: Product, Protective Concrete Sprinkler Blocks, Inc., Model M30SBA, or equal.

B. Identification Markers:

1. Detectable Warning Tape: Minimum 3-inch wide, 5 mils thick inert plastic tape with continuous layer of aluminum foil encased in the plastic. Tape identification shall match the utility being marked on all mainline.
2. Valve Identification Tags: Polyurethane tag with integral attachment neck and reinforced attachment hole. Tag shall be hot stamped alphanumeric lettering 1-1/8 inches in height.
3. Control Wire Numbering Labels: Self-adhesive alpha-numeric labels.

C. Concrete for Thrust Blocking: All concrete for thrust blocks shall achieve minimum strength of 3000 psi at 28 days.

D. Quick Coupler Stabilizing Wing: Polyester-coated ductile-iron, with stainless steel bolt; Leemco or equal.

E. Protective Concrete Sprinkler Blocks: Precast smooth-finished concrete slabs with hole formed for passage of a pop-up type sprinkler head, able to withstand vehicular traffic without breakage or subsidence.

- F. Drainage Backfill: Cleaned gravel or crushed stone, open graded from 4 inch maximum to 1/4 inch minimum.
- G. Sand: Clean, suitable for backfilling and bedding pipe.
- H. Pipe Insulation Sealing Tape: 5 mil tape designed to adhere to polyethylene pipe insulation to seal butt joints, gaps and seams in polyethylene pipe insulation.
- I. All other materials not specifically described but required for a complete and proper irrigation system installation shall be new, first quality of their respective kinds, and subject to approval.

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. Prior to all work of this Section, carefully examine the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. Verify that irrigation system may be installed in strict accordance with all pertinent codes and regulations, the original design, the referenced standards, and the manufacturer's recommendations.
- C. In the event of discrepancy, immediately notify the Owner's Representative. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved. Start of work denotes acceptance.
- D. Install materials and equipment in strict accordance with manufacturer's written specifications and recommendations and all applicable codes.
- E. Provide protection at all times to keep rock, dirt, gravel, debris, and all other foreign materials from entering piping, valves, and other irrigation equipment.

#### 3.2 LAYOUT

- A. Make all necessary measurements in the field to ensure precise fit of items in accordance with the approved Shop Drawings.
- B. Layout to follow as closely as practicable the design as shown on the Drawings. Use field marking paint to stake out mainline routing and locations of all proposed equipment, for acceptance by Owner's Representative, prior to trenching.
- C. Full and complete coverage without overthrow onto roadways, sidewalks or buildings is required unless otherwise accepted by Owner's Representative.
- D. Systems shall meet minimum pressure at last head in each zone as shown on approved Shop Drawings. Notify Owner's Representative immediately if any modification of piping

layout will be required to accomplish this. Do not proceed until layout has been verified in the field with the Owner's Representative.

- E. Follow pipe layout plan making modifications as necessary to avoid trenching through roots of existing trees or other obstructions. Take care in protecting all existing tree root zones.
- F. Locate valves/valve boxes in planting beds, (not in lawn areas). Locate mainline 24 inches from the edge of paving, or in lawn areas 24 inches from the edge of the adjacent planting bed. Avoid locating valves at low points and in swales to avoid flooding of valve boxes.

### 3.3 WATER SOURCE

- A. Connect system as indicated on the approved Shop Drawings. Make arrangements with the Owner for water shut-off, if necessary.

### 3.4 TRENCHING

- A. Refer to Division 31 Section "Earth Moving" for excavating and trenching.
- B. Locate existing utilities. Trench along routes as indicated on approved Shop Drawings.
- C. Trenches to be straight and true or conform to adjacent curved edges, with bottom uniformly sloped at a minimum 1 percent.
- D. Provide minimum cover over top of underground piping according to the following:
  1. Irrigation Mainline Piping: Minimum depth of 24 inches below finished grade, or not less than 18 inches below average local frost depth, whichever is deeper.
  2. Lateral Line Piping: 18 inches.
  3. Drain Piping: 18 inches.
  4. Sleeves: 24 inches under paving; 36 inches under roads.
- E. Keep trenches free of pipe-damaging rocks and debris.
- F. Trench to be 12 inches wide minimum and wide enough to allow all pipes to lie side by side with 6-inch minimum separation between pipes.
- G. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

### 3.5 PIPE

- A. Do not use solvent cement on threaded joints. Wrap joints with minimum three wraps of Teflon tape.

- B. Ensure that the inside of the pipe remains absolutely clean. Pipe ends shall be protected and not left open. Remove all foreign matter and dirt from inside of pipe before lowering into trench.
- C. Lay pipe in accordance with standard practices, on solid foundation, uniformly sloped, substantially supported at all locations. "Snake" pipe slightly from side to side in trench to allow for expansion and contraction. Keep pipe markings visible.
- D. PVC pipe joints to be solvent welded except as indicated on the Drawings. Cut pipes square, deburr, wipe from surface all saw chips, dust, dirt, moisture and all foreign matter which may contaminate the cemented joint. Clean pipe with pipe cleaner to remove dirt, oil and grease. Apply primer and solvent cement. Make joints in accordance with manufacturer's recommendations.
- E. For 90-degree turns in mainline pipe, install two 45-degree fittings.
- F. For non-standard angles and bends, install double fittings to avoid stressing the pipe or fittings.
- G. Underground lines shall have a minimum horizontal and vertical clearance of 12 inches from other utility lines. For lines crossing at angles from 45 degrees to 90 degrees with each other, maintain 6-inch vertical clearance. No line shall be installed parallel to and directly over another line.
- H. Provide 6 inches clearance between pipes. Do not stack pipe unless accepted by Owner's Representative to avoid tree roots.
- I. Do no solvent welding of pipe when raining or when temperature is below 40 degrees Fahrenheit.
- J. No fittings are to be closer than 6 inches apart.
- K. Obtain tight, inseparable joints. Allow 24-hour curing before testing.
- L. Install concrete thrust blocks at all changes of direction for mainline pipe 2-1/2 inch or greater in diameter. Place a minimum of 1 cubic foot of fully mixed concrete against the pipe and firm undisturbed soil in accordance with the pipe manufacturer's recommendations.
- M. Provide pipe insulation on mainline and lateral line pipe on-structure having less than 18 inches of cover. Provide insulation sealing tape continuously along seam of pipe insulation.

### 3.6 IRRIGATION SLEEVES

- A. Install piping and wiring in sleeves under sidewalks, roadways, parking lots, and railroads.
  - 1. Install piping sleeves by boring or jacking under existing paving if possible.

- B. Install separate sleeves for irrigation lines and control wires under pavement prior to placing pavement materials wherever possible.
- C. Provide pipe insulation on mainline and lateral line pipe sleeves on-structure having less than 18 inches of cover. Provide insulation sealing tape continuously along seam of pipe insulation.
- D. Extend sleeves beyond pavement edge a minimum of 12 inches. Install sleeves with minimum 24 inches depth of cover to the top of the pipe.
- E. If length of required sleeve is greater than the length of the unit of pipe, solvent weld joints. Otherwise all sleeves shall be of one continuous length of pipe.
- F. Tape ends of sleeve closed to keep soil out of the sleeve until irrigation lines and control wire are installed.
- G. Permanently attach a single length of 14 gauge trace wire above the entire length of the sleeve.
- H. Stake both ends of sleeves with a readily visible stake extending 12 inches above-grade and below-grade to the bottom of the sleeve. Mark the above-grade portion of the stake with the words "Irrig. Sleeve". Remove stakes after sleeves are recorded on As-Built Drawings and after irrigation lines and control wires are installed and accepted by Owner's Representative.

### 3.7 CONTROL WIRING

- A. Install per manufacturer's instructions with minimum 24 inch expansion loop at each controller.
- B. All wire splicing to be made waterproof by using U.L. approved wire connectors and sealant. Follow manufacturer's instructions for installation.
- C. All wire splicing shall occur only at the valve or at the controller.
- D. Provide 2 spare wires, yellow in color, making a circuit to all valves and to controller. Coil 48 inches length neatly in each box.
- E. Lay wire in trenches adjacent to mainline or lateral lines for maximum protection. Place wires 18 inches below grade in electrical conduit where there are no pipes in the trench.
- F. Control wires to each solenoid from controller shall have a colored jacket, and common neutral wires shall have a white jacket.
- G. All valve wiring back to controller to be identified and labeled with self-adhesive labels manufactured for this purpose prior to installation of the controller and remote control valves.
- H. Control wires sharing the same controller shall all be the same color.

- I. Provide different color pilot wires for each controller installed on the Project.
- J. Where there is more than one controller, common wires shall be white with a colored stripe to match the pilot wire color with which it is circuited.
- K. Bundle and tape wires together at 10-foot intervals.
- L. Provide 24 inches expansion loops at least every 100 feet in runs of more than 100 feet in length, at changes in direction along the mainline, and at entrance and exits to all sleeves under paving. Provide 24-inch expansion coils at connection to control valves. Provide expansion loops in neat 1-inch diameter coils.
- M. Master Valve Control Wires shall be orange and white dedicated common wire for the master valve only, and with a yellow wire as a spare.
- N. Flow Sensor Cable: Install cable from flow sensor to controller in electrical conduit.

### 3.8 VALVES

- A. General:
  - 1. Install valve boxes plumb to grade in a neat and uniform pattern per manufacturer's directions, and as shown on the Drawings.
  - 2. Install valve with 3 inch of clearance between top of valve and underside of valve box cover.
  - 3. Install 1 cubic foot of drain rock in the bottom of all valve boxes.
  - 4. Provide 1-inch clearance between bottom of valve assembly and top of drain rock.
  - 5. Thoroughly flush supply lines before installing valves.
- B. Control Valves:
  - 1. Install only one remote control valve per box.
  - 2. Provide schedule 80 PVC threaded nipples and unions at on both sides of the each control valve.
  - 3. Follow manufacturer's instructions and adjust pressure regulating module to achieve optimum operating pressure for each zone.
- C. Drain Valves:
  - 1. Install manual drain valves at low points along mainline to ensure complete gravity drainage of all mainlines. More drain valves may be required than are shown on approved Shop Drawings. Provide required number of drain valves at no additional cost to the Owner.
  - 2. Install one drain valve in point of connection vault immediately downstream of backflow preventer.
  - 3. Pipe drain valves into approved drainage structures. Install drain piping with minimum of 18 inches of cover to top of pipe.

4. Drain Pockets: Where no drainage structures exist, excavate [1] cubic yard of soil material at discharge to drain valves. Backfill with drainage backfill to 12 inches below grade. Wrap drainage backfill with drainage fabric and backfill remainder with amended topsoil.
- D. Quick Coupling Valves:
1. Provide schedule 80 PVC threaded nipples and fittings at quick coupler and ball valves.
  2. Install quick coupler valves at 100-feet on center along all mainline and one at the point-of-connection and at each trash enclosure.
  3. Stabilize quick coupler nipple with one 24-inch number 4 rebar stake or quick coupler stabilizing wing. Attach stake to nipple with two 1/2-inch stainless steel worm drive hose clamps.
- E. Isolation Valves: Install isolation valves along mainline at all points-of-connection and upstream of all road crossings. Install plumb to grade in a neat and uniform pattern as per manufacturer's directions, and as shown on Drawings.

### 3.9 FLUSHING

- A. Flush lines with water for a minimum of 5 minutes each zone prior to installation of irrigation heads.
- B. Cap risers immediately after flushing.

### 3.10 LABELING AND IDENTIFYING

- A. Equipment Nameplates and Signs: Where there is more than one controller on the Project, install engraved plastic-laminate equipment nameplates and signs on each automatic controller.
- B. Install valve identification tags on each automatic control valve per manufacturer's recommendations.
- C. Install control wire numbering labels on each control wire to correspond with the valve station number at both ends of the control wires. Label spare and trace wires.
- D. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tape over underground piping, during backfilling of trenches.

### 3.11 TRACE WIRE

- A. Place one strand of trace wire for all mainlines, and leave end at point of connection location. Tape wire to top of mainline at no less than 36-inch intervals. All locator wire shall be spliced together with water-tight splice connectors.
- B. Run a 12-inch loop of trace wire into each remote control valve box for ease of detection.

**3.12 PRESSURE TESTING**

- A. Notify the Owner's Representative five days before pressure testing.
- B. Backfill trenches sufficiently to ensure the stability of pipe, leaving joints exposed.
- C. Mainline and lateral lines may be tested at different times to allow isolation of either
- D. Supply certified pressure gauge and force pump during tests.
- E. Mainline Testing:
  - 1. Thoroughly flush piping before testing. Cap all fittings on mainline fill with water.
  - 2. Test mainlines to control valves at 100 psi for 1 hour. If pressure loss occurs, inspect the entire system, make water-tight, and retest until no pressure loss occurs for the testing period.
  - 3. Pressure test must show no pressure loss for the specified period and be accepted by the Owner's Representative before backfill of trenches will be allowed.
- F. Lateral Line Testing
  - 1. Thoroughly flush piping before testing. Cap all fittings on lateral lines and fill with water.
  - 2. Adjust bleed screws to open remote control valves to allow a downstream pressure of 100 psi. Use motorized air compressor as needed to achieve pressure.
  - 3. Maintain 100 psi pressure for 1 hour before and during observation by Owner's Representative without the aid of air compressor.
  - 4. Installation may not leak or lose pressure during test period.
  - 5. Detect and repair leaks and retest system until acceptance is granted.
- G. Drip Tubing Testing:
  - 1. Before backfilling, maintain 45 psi pressure for 15 minutes before and during inspection by Owner's Representative.
  - 2. Installation may not lose pressure or experience breaks at barbed fittings during test period.
  - 3. Detect and repair leaks and re-test system until accepted by Owner's Representative.

**3.13 BACKFILLING**

- A. Refer to Division 31 Section "Earth Moving" for backfilling.
- B. Delay backfilling until piping is pressure tested and accepted.
- C. Place clean sand 3 inches below and 6 inches above all pipe. Fill the rest of the trench with approved material, free of rocks and debris capable of damaging pipe. Compact to adjacent soil density in 6 inches lifts.
- D. Stones larger than 1-inch diameter are not allowed in backfill material.

- E. Place metallic locating tape in all mainline trenches in accordance with manufacturer's instructions.
- F. Fill mainline with water at approximately 25 psi during backfilling operations.

### 3.14 IRRIGATION HEADS

- A. Install irrigation heads after pressure test approval.
- B. Install sprinkler heads of types, sizes, and coverage at locations shown on the approved Shop Drawings and as detailed on Drawings.
- C. Minor changes in head location may be necessary to achieve head to head coverage at no additional cost to Owner. Notify Owner's Representative for approval prior to making any changes. Document all changes on Project Site As-built Drawings as they occur.
- D. Provide freedom of movement at all swing and swivel joints.
- E. Install sprinkler outlets with a flow less than 4 gallons per minute on flexible polyethylene swing joints, with spiral barbed fittings. Length of pipe not to exceed 20 inches.
- F. Install sprinkler outlets with flows equal to or greater than 4 gallons per minute on rigid PVC triple swing joints.
- G. Adjust and set nozzle radius, arc and trajectory for optimum performance. Exchange nozzles as required to achieve desired performance.
- H. Locate heads adjacent to planters, mowstrips, walks, pavement, and curbs with a 2-inch minimum and 3-inch maximum clearance between head and hard surface.
- I. Locate no head closer than 6 inches from building foundation.
- J. Install protective concrete sprinkler blocks on sprinkler heads adjacent to vehicular paving where heads are not protected by curbs as approved by the Owner's Representative.

### 3.15 FIELD QUALITY CONTROL

- A. Control System Field Service: Engage a manufacturer's factory-authorized service representative to inspect, test, and adjust field-assembled controller components and equipment installation, including connections, and to assist in field testing . Report results in writing. Representative to verify that all controller-related components are properly assembled and ready for use.
- B. Backflow Preventer Testing: All backflow preventers shall be tested and certified for proper operation prior to being placed in operation.
  - 1. Original copies of the certification shall be submitted to the Owner.
  - 2. Backflow preventers shall be labeled with plastic laminated field history tag showing date and tester information.

C. Irrigation Coverage Test:

1. The coverage test procedure will be conducted by the Owner's Representative only if the entire irrigation system is completely automated to include permanent electrical power.
2. Prior to the coverage test, make all required adjustments to the irrigation systems. Test the system to assure that all areas are irrigated completely and uniformly. Change or adjust heads and nozzles as required to provide full coverage, matching precipitation rates and meeting final grades. Do not spray onto pavement or structures.
3. When the sprinkler irrigation system is completed, but prior to planting, perform a coverage test in the presence of the Owner's Representative to determine if the irrigation coverage for all planting areas is complete and adequate. Notify the Owner's Representative 48 hours in advance for the irrigation coverage test.
4. Furnish all materials and perform all work required to correct any inadequacies, to the complete satisfaction of the Owner's Representative. This shall include any changes affecting coverage due to any deviation from plans.
5. Operating sequence for all control valves must match the sequence as shown on the Drawings.
6. Provide a minimum of two working individuals for the duration of each coverage test. Each individual provided by the contractor must have a two-way communication device for proper manipulation of the control valve sequencing of the irrigation system during the coverage test procedure. The lead individual must be a representative from the installing contractor's company. During the irrigation coverage test, bring keys to unlock cabinets and valve boxes. Open all controller cabinets, enclosures, valve boxes which are part of the irrigation system.
7. At the end of the coverage test for any specified area, a Field Observation Report shall be generated by the Owner's Representative. This report shall serve as an Item/Action notification which may require the contractor to make changes and repairs as noted therein.
8. One return site observation shall be provided by the Owner's Representative to determine whether the items listed in the first site observation report have been corrected. After making the corrections noted in the Field Observation Report, notify the Owner's Representative at least 48 hours in advance, and perform another coverage test in the presence of the Owner's Representative for approval.
9. If the items have not been fully corrected or repaired to the complete satisfaction of the Owner's Representative, and as noted in the first Field Observation Report, the contractor must reschedule another field observation and shall bear all financial responsibility to reimburse the Owner for all costs incurred by the Owner's Representative for the failed field observation performed.
10. Any item listed in the Field Observation Report requiring action that is not considered to be a part of the original contract, must immediately be brought to the attention of the Owner. This shall be the responsibility of the contractor and must be done in a manner as to enable the contractor to correct the item prior to the next field observation.
11. Upon completion of each phase of work, the entire system shall be tested and adjusted to meet site specifications.

- D. Irrigation Water Audit: Engage a Certified Landscape Irrigation Auditor or equivalent, to conduct a landscape irrigation water audit in accordance with The Irrigation Association's Landscape Irrigation Auditors Manual, latest edition.
1. Water audit will include data collection, spread sheets, and calculations for each irrigation station or zone showing:
    - a. Catch can results.
    - b. Precipitation rate calculations.
    - c. Percent efficiency.
    - d. Soil type infiltrations rates.
    - e. Plant type.
    - f. Water requirements based on evapotranspiration rates by season and adjusted by micro-climates.
  2. Provide seasonal irrigation schedules based water audit data collection and results.

#### 3.16 STARTUP SERVICE

- A. Verify that controllers and all associated components are installed and connected according to the Contract Documents and are functioning properly.
- B. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements in Division 26 Sections.
- C. Complete startup checks according to manufacturer's written instructions.

#### 3.17 CLEANUP

- A. Remove debris from project site upon completion or sooner, if directed.

#### 3.18 FINAL INSPECTION

- A. Thoroughly flush, clean, adjust, and balance the entire irrigation system for complete coverage and efficient operation. Set heads to avoid over-spray on walks. Set up control wires to operate in an organized clockwise pattern. Upon 5 days written notice, demonstrate the entire system to the Owner's Representative, proving that all valves and controls are properly operating and that the installed system is workable, clean, and efficient.
- B. Contractor to deliver to the Owner the items scheduled for submittal at the time of the final inspection for irrigation.
- C. Upon completion of the installation, turn over the following spare parts and specialty tools to the Owner. Include with the following quantities of items a list of each part with appropriate part number (for ordering replacement products) and local supply store of where these parts can be purchased:

1. (50') of Landscape Dripline tubing for each dripper interval and discharge rate.
2. (6) barbed couplings.
3. (6) barbed 90 degree elbow fittings.
4. (6) barbed tee fittings.
5. (6) 180 degree 2-way adapter tees.
6. (6) male adapters with 3/4-inch FPT.
7. (1) spare Y-strainer filter element of the mesh size indicated on the irrigation legend.

### 3.19 WARRANTY

- A. Full and complete head to head irrigation coverage without overthrow onto roadways, sidewalks, or buildings is required.
- B. The warranty period relating to all products, materials, and workmanship will begin on the date of final acceptance of the work and extend for the period of one year.
- C. The Contractor must repair or replace all defective materials and workmanship during the warranty period. The conditions of the warranty applies to all replacement material and repair work from the date such materials are installed or repair work done.

### 3.20 ADDITIONAL REQUIREMENTS

- A. Provide Owner's Maintenance Personnel with system familiarization and 8 hours minimum of instruction in maintenance and operation of each piece of equipment installed.
- B. Repair settling trenches. Include complete restoration of plantings, mulch, grades, pavements or other improvements.
- C. Fall Winterizing Visit: Return to the job site at the beginning of the first winter season to perform a general inspection of the system, test all valves, lines, sprinkler heads, vacuum breakers, repair all leaks and faulty work, check operation of the system, adjust spray patterns for full coverage, drain system, show maintenance staff location of all drain valves and blow out points and restore all areas where trenches have settled.
- D. Spring Start-Up Visit: Return in spring after the first winter season for system check and if necessary, restore system for spring and summer operation. Explain system and operation methods to maintenance staff. Restore all areas where trenches have settled.

END OF SECTION 32 8410

**SECTION 32 9113 - SOIL PREPARATION****PART 1 - GENERAL****1.1 SUMMARY**

- A. Furnish labor, material and equipment required for placement and amendment of topsoils for areas to be planted, and the establishment of finish grades as shown on the Drawings and as specified herein.
- B. Coordinate work with installation of other site work including earthwork, irrigation, seeding, and planting.
- C. Related sections include the following:
  - 1. Division 01 Section "Temporary Tree and Plant Protection," for protecting trees remaining on-site that are affected by site operations.
  - 2. Division 31 Section "Earth Moving" for preparation of subgrades prior to placement of topsoils and planting soils specified in this section.
  - 3. Division 32 Section "Lawn and Grasses" for seeding of prepared topsoil designated for lawns.
  - 4. Division 32 Section "Plants" for planting placement of amended topsoil backfill.

**1.2 DEFINITIONS**

- A. Finish Grade: Elevation of finished surface of amended topsoil soil.
- B. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil
- C. Amended Topsoil: Native or imported topsoil or surface soil modified with soil amendments and fertilizers.
- D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.
- E. Topsoil: See Part 2 – Products.

**1.3 SUBMITTALS**

- A. Product Data. Include Material Safety Data Sheets (MSDS) where applicable: For the following:
  - 1. Fertilizers, including application rates.
  - 2. Soil Amendments.
  - 3. Herbicides.

B. Samples for Verification: For the following:

1. 1/2 cubic foot compost.
2. 1/2 cubic foot of each imported topsoil. Furnish one sample from each site from which soil is to be furnished.

C. Product Certificates: For each type of manufactured product, signed by product manufacturer, and complying with the following:

1. Manufacturer's certified analysis for standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

D. Qualification Data: For testing agencies.

E. Material Test Reports:

1. Soil Fertility and Agricultural Suitability Analyses and Recommendations Reports for the following:
  - a. Existing on-site topsoil: From three typical locations as selected by Owner's Representative, minimum 30 days prior to beginning soil preparation work.
  - b. Imported topsoil: Minimum 30 days prior to beginning soil preparation work.
  - c. Amended topsoils: Provide soil analyses and results for soil samples taken from 3 typical locations as selected by Owner's Representative, minimum 7 days after soil preparation work has been completed and prior to installing plants.
2. Compost Analysis: Provide analysis for one representative sample of compost minimum 30 days prior to compost being delivered to Project Site.
3. Compost Maturity: Provide results of Compost Maturity Test when submitting Compost Analysis Report and sample.
4. Soil Compaction Test: Provide results of soil compaction tests minimum of 7 days prior to planting and seeding.

F. Delivery Slips: Provide delivery slips as proof of shipment of specified materials.

#### 1.4 QUALITY ASSURANCE

A. Soil Fertility and Agricultural Suitability-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

1. Acceptable Soil Testing Laboratories are:

- a. Soil and Plant Laboratory, Inc., (503) 557-4959.
- b. A & L Western Agricultural Laboratories, (503) 968-9225.
- c. Western Laboratories, Inc, (800) 658-3858.

B. Soil Analyses: Furnish soil analyses by a qualified soil-testing laboratory stating:

1. Soil Composition: USDA particle size analysis indicating percentages of sand, silt and clay, and percent organic matter.
2. Macro and micro nutrient fertility tests as determined by pH, salinity, nitrate nitrogen, ammonium nitrogen, phosphate phosphorous potassium, calcium, magnesium, soluble copper, zinc, manganese, iron, saturation extract boron and sodium analyses.
3. Sodium Absorption Ratio (SAR).
4. Recommendations by the soil testing lab for fertilizer and soil amendments in pounds per 1,000 square foot or tons per acre, as necessary to correct soil deficiencies.
5. Noxious Weed Germination Test: a minimum of one 36 inch square by 3 inch deep soil sample for each topsoil source considered for use on the project. Place soil in tray with adequate drainage layer beneath, keep soil moist (not saturated) for 7 days in a temperature controlled greenhouse environment, provide photos and written report summarizing germination results.

C. Compost Testing Laboratory Qualifications: An independent laboratory, with the experience and capability to conduct the testing indicated following U.S. Composting Council Seal of Testing Assurance (STA) procedures, or equivalent.

1. Acceptable STA Compost Testing Laboratories are:

- a. A & L Western Agricultural Laboratories, (503) 968-9225.
- b. Control Laboratories, (831) 724-5422.

D. Compost Analysis: Provide documentation from supplier that compost has reached a monitored temperature of 140 degrees Fahrenheit for at least one week. Engage an independent soil testing laboratory to test representative sample(s) of compost and furnish compost analysis report for the following parameters:

1. Percent organic matter, percent moisture, percent inerts (foreign matter), pH, soluble salts, and particle size.
2. Nutrient content, including: Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca), and Magnesium (Mg) and Sulfur (S).
3. Trace Metals, including: Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), and Zinc (Zn).
4. Maturity Indicator. Provide bio-assay results. Provide Carbon-Nitrogen ratio.
5. Stability Indicator: Provide respiration test results.

E. Request inspection and allow observation by Owner's Representative of prepared soils before planting.

F. Soil Compaction Testing: Furnish soil compaction standard tests per ASTM 698. Request inspection and allow observation by Owner's Representative of prepared soils before planting.

**1.5 DELIVERY, STORAGE AND HANDLING**

- A. Deliver packaged materials in manufacturer's unopened containers fully identified by name, brand, type, weight and analysis.
- B. Store and handle packaged materials to prevent damage and intrusion of foreign matter.
- C. Store stockpiled topsoil in area designated by Owner's Representative. Provide erosion control measures for stockpiled topsoil on site to prevent contamination of the soil. Refer to Division 31 Section "Earth Moving" for control of dust and erosion.

**1.6 SOIL AMENDMENT BID QUANTITIES**

- A. Bid quantities and types of soil amendments shall be based upon those listed in this Section. Types of amendments required and quantities shall be adjusted as necessary based upon actual results of soil fertility and agricultural suitability analyses and recommendations for on-site topsoils.
- B. Amount per 6-inch lift of topsoil over 1000 square-feet of landscape area:
  1. 25 lbs. Gypsum (Calcium sulfate)
  2. 35 lbs. Calcium carbonate limestone 'Calpril'
  3. 35 lbs. Dolomite limestone 'Dolpril'
  4. 8 lbs. Treble superphosphate (0-45-0)
  5. 3 lbs. Ammonium nitrate
  6. 4 ozs. Zinc sulfate
  7. 8 ozs. Manganese sulfate
  8. 1 oz. Laundry Borax
  9. 6 cu-yds Compost

**1.7 SITE CONDITIONS**

- A. Topsoil placement and soil preparation shall not take place during periods where saturated soil or surface water is present in work areas.
- B. Work shall not take place when temperature is less than 32 degrees Fahrenheit, or when frozen soil exists on site.

**1.8 COORDINATION**

- A. Coordinate soil preparation with Division 31 Section "Earth Moving" such that topsoil, soil amendments and fertilizers are incorporated into ground fill areas in specified lifts to specified depths below finish grade for both planting areas and lawn areas. Topsoils shall be amended per recommendations of the Soils Testing Laboratory.
- B. Coordinate work with installation of other site work, including irrigation, seeding, and planting.

## PART 2 - PRODUCTS

### 2.1 TOPSOIL

- A. Topsoil Definition: ASTM D 5268; natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles, conforming to USDA classification for Loam or Sandy Loam; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inches in any dimension; and free of weeds, roots, and other deleterious materials, with the following physical properties:
1. Organic Matter: 6 percent minimum to 10 percent maximum.
  2. Sodium Adsorption Ratio (SAR): less than 6.0.
  3. Saturation Extract concentration for Boron: less than 1.0.
  4. pH range of from 6 to 8 (plus 0, minus 0.5).
  5. Saturation Extract Conductivity: less than 4.0 dS/m @ 25 degrees Celsius as determined in a saturation extract.
  6. Non-soil components: less than 1 percent by volume.
  7. Heavy metal concentrations: below the USDA per year load limit.
  8. Minimal weed seed.
    - a. If regenerative noxious weeds (including, but not limited to, quack grass, nutsedge grass, and horsetail) are present in the soil, all resultant growth including roots shall be removed throughout one-year period after acceptance of work at no additional cost to Owner.
- B. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth. Ensure no contamination of the soils occurs during earthwork and grading, and that the soil remains friable and free of debris.
1. Import Topsoil: Supplement on-site topsoil with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

### 2.2 INORGANIC SOIL AMENDMENTS

- A. Dolomitic Lime: Natural, agricultural limestone (calcium and magnesium carbonate) containing a minimum of 20 percent calcium and 11 percent magnesium and as follows:
1. Screen Analysis: 100 percent passing through No.30 sieve; 70 percent passing through No. 100 sieve; and minimum 30 percent passing through No.325 sieve.
  2. Provide lime in form of granulated, prilled, dolomitic limestone, 'DoloPril' by Pacific Calcium, Inc., (877) 571-3555, or equal.
- B. Calcitic Lime: Natural, agricultural limestone (calcium carbonate) containing a minimum of 36 percent calcium and as follows:

1. Screen Analysis: minimum of 100 percent passing through No. 10 sieve and a minimum of 80 percent passing through No. 100 sieve.
  2. Provide lime in form of granulated, prilled, limestone, 'CalPril' by Pacific Calcium, Inc., (877) 571-3555, or equal.
- C. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.
- D. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- E. Aluminum Sulfate: Commercial grade, unadulterated.
- F. Gypsum: Agricultural gypsum; minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.
- G. Sand: Clean washed river sand, free of calcium, chlorides and other deleterious substances.

### 2.3 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-decomposed, commercially manufactured, stable, and weed-free organic matter, no food waste shall be a part of the compost from agricultural, biosolids, or yard debris sources; pH range of 5.5 to 7.5; 100 percent passing through 1/2-inch sieve; soluble salt content of 2.5 to 7.5 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and shall conform as follows:
1. Tested, at minimum, every six months for noxious weeds.
  2. Organic matter source (feedstock): Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
  3. Organic Matter Content: 55 to 70 percent of dry weight as determined by ash method.
  4. Moisture Content: 40 to 60 percent by weight
  5. Free of refuse (less than 1 percent by dry weight), plastics, contaminants or any material toxic to plant growth.
  6. Processed to meet U.S. Composting Council's Seal of Testing Assurance Program, or equivalent.
  7. Carbon to Nitrogen Ratio: 40 to 1 or lower.
  8. Composted for a minimum of 120 days and reach a monitored temperature of 140 degrees Fahrenheit for at least one week.
  9. Available Suppliers:
    - a. Rexus Forest By-Products, Inc., phone (541) 342-1835.
    - b. McFarlane's Bark, phone (503) 659-4240.
    - c. American Compost & Recycling, LLC, phone (503) 286-0886.
    - d. Or equal.

**2.4 FERTILIZER**

- A. Fertilizer composition and rate to be determined based upon soil analysis. For bidding purposes, assume: 10 Nitrogen (N), 10 Phosphorus (P), 10 Potassium (K), 5 Sulfur (S) applied at a rate of 10 pounds per 1000 square feet in all planting beds and seeded areas.
- B. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 10 percent phosphoric acid.
- C. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- D. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent of urea formaldehyde, phosphorous, and potassium in the following composition:
  - 1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- E. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium derived from natural organic and inorganic sources in the following composition:
  - 1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

**2.5 MISCELLANEOUS PRODUCTS**

- A. Post-Emergent Herbicide: Select one of the following: "Glyphogan Plus" by Mana, "Envoy Plus" by Valent, "Crossbow" by Dow AgroSciences, "Landmaster BW" by Agri Star or approved equal.
- B. Pre-Emergent Herbicide: "Ronstar-G" by Bayer, "Dimension EC," by Dow AgroSciences or equal. Products containing either pendimethalin or DCPA are prohibited.
- C. Contact Herbicide for controlling nutsedges: "SedgeHammer" by Gowan.

**PART 3 - EXECUTION****3.1 EXAMINATION OF SITE CONDITIONS**

- A. Examine for site conditions that will adversely affect execution, permanence, quality of work, and survival of plant material and grasses.
- B. Verify that subgrades and slopes of lawn and planting areas are acceptable to Owner's Representative prior to commencing work of this Section.

- C. Should the Contractor find any discrepancies between the Drawings and the physical conditions, inform the Owner's Representative immediately for clarification.
- D. Begin Work required under this Section only after conditions are satisfactory.

### 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, and existing lawns and exterior plants from damage caused by soil preparation operations.
- B. Prepare soils at a time when moisture conditions will permit proper cultivation.
- C. Remove stones over 1-inch diameter, sticks, roots, mortar, concrete, rubbish, debris, and all materials harmful to plant life, and legally dispose of them off Owner's property.
- D. Remove or spray as required to eradicate noxious weed growth and roots.
  - 1. Achieve complete removal or kill of all weeds within all areas receiving new plantings and lawn areas.
  - 2. In planting beds, kill achieved by working soil is permissible for annual non-noxious broad-leaf type weeds.
  - 3. Apply post-emergent herbicide over all areas of weed or grass growth within landscaped area to eradicate weed growth and roots. Apply in two applications at manufacturer's maximum recommended rate, as follows:
    - a. First application: Apply 7 days prior to performing soil preparation.
    - b. Second application (to kill new vegetation): Apply after soil preparation has been completed and minimum of 48 hours prior to planting.
    - c. Observe manufacturer's recommended period prior to working in treated areas.
  - 4. Apply contact herbicide directly onto foliage of nutsedges. In areas of established lawn grasses infested with nutsedge, apply herbicide by wicking. Do not spray.
- E. Locate and securely mark or flag irrigation sprinkler heads, area drains, catch basins, clean outs, manholes, valve boxes, and other site improvements not extending above finish grade.

### 3.3 SOIL PREPARATION FOR PLANTING AREAS

- A. This article pertains to those shrub bed areas indicated as "Shrub and Groundcover Planting Areas" on the Drawings where mass plantings of trees, shrubs and ground cover plants are scheduled.
- B. Prepare subgrades by excavating and removing soil, rock and other construction material to 12 inches below finish grade. Cross-rip subgrades to depth of 6 inches prior to placing topsoil. See Division 31 Section "Earth Moving" for excavation and preparation of subgrades.

- C. Place 4 inches topsoil, compost, soil amendments, and fertilizers as recommended in Agricultural Soil Suitability Report per 1,000 square feet and rototill thoroughly to a depth of 8 inches. Compost shall constitute 5% of the amended soil. Place remainder of topsoil, compost, soil amendments, and fertilizers as recommended in Agricultural Soil Suitability Report per 1,000 square feet and rototill thoroughly to a depth of 8 inches, allowing for compaction, natural settlement, and depth of specified mulch.
  - 1. It is the Contractor's option to set up a facility on-site for the preparation and amendment of topsoils, instead of preparing and amending the topsoils in place as indicated in the paragraph above.
  - 2. Set up facility in location as directed by Owner's Representative.
- D. Water lightly and allow planting mix to settle. Add additional material at mixture indicated in paragraph above to bring soil level to grades shown on the Drawings with allowance at pavement edges for mulch placement. Provide compaction to 80 [85] percent relative density or as indicated in Division 31 Section "Earth Moving."
- E. Meet lines, grades and elevations shown, after light rolling and natural settlement. Fine grade shrub and ground cover areas to smooth even surface with loose, uniformly fine texture. Rake and drag shrub and ground cover areas to remove ridges and fill depressions to obtain firmness and finish grades preparatory to receiving planting.
- F. Remove stones over 1/2-inch in any dimension and sticks, roots, rubbish and other extraneous matter.

#### 3.4 SOIL PREPARATION FOR SEEDED LAWNS

- A. This article pertains to new lawns and grasses as shown on Drawings and existing lawn and grass areas disturbed by construction activities.
- B. Prepare subgrades by excavating and removing soil, rock and other construction material to 4 inches below finish grade. Cross-rip subgrades to depth of 6 inches prior to placing topsoil. See Division 31 Section "Earth Moving" for excavation and preparation of subgrades.
- C. Place topsoil and compost as recommended in Agricultural Soil Suitability Report per 1,000 square feet. Rototill thoroughly to a depth of 8 inches, tilling topsoil into top 2 inch layer of sub-soil. Place sufficient topsoil allowing for compaction and natural settlement.
- D. Place remaining soil amendments, and fertilizers as recommended in Agricultural Soil Suitability Report per 1,000 square feet.
- E. Unless already required by the recommendations of the Agricultural Soil Suitability Report apply the following additional soil amendments:
  - 1. Compost: 1 inch minimum depth
  - 2. Calpril Lime: 12.0 pounds. per 1,000 square feet
- F. Incorporate remaining soil amendments into topsoil of lawn areas to a total depth of 4 inches.

- G. Leveling Rolling: Drag with flexible tine harrow (or approved equipment) to remove ridges and fill depressions, as required to meet finish grades. Roll areas (minimum roller weight 10 pounds per square inch) in two opposing directions.
- H. Repeat rolling procedures and drag lightly to establish a smooth uniform compacted surface free of rocks and other extraneous matter. Provide compaction to 80 percent relative density or as indicated in Division 31 Section "Earth Moving."
- I. Water lightly and allow planting mix to settle. Add additional material at mixture indicated in paragraph above to bring soil level to grades shown on the Drawings with allowance at pavement edges. Provide compaction to 80 percent relative density or as indicated in Division 31 Section "Earth Moving."
- J. Meet lines, grades and elevations shown, after light rolling and natural settlement. Fine grade lawn areas to smooth even surface with loose, uniformly fine texture. Rake and drag lawn areas to remove ridges and fill depressions to obtain firmness and finish grades preparatory to receiving lawn planting.
- K. Remove stones over 1/2-inch in any dimension and sticks, roots, rubbish and other extraneous matter.
- L. Finish Grading: Grade lawn areas to smooth, even surface with a loose uniformly fine texture. Finish grade of soil shall be 1/2 inch below adjacent pavement. Limit preparation to areas which will be planted promptly after preparation.
- M. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- N. Restore seed bed areas to specified condition if eroded, hardened or glazed by the cycle of precipitation and drying or in any manner otherwise disturbed after fine grading has been completed and prior to commencing seeding operations. Restoration of seed bed areas shall be considered as incidental to the project Work and shall be completed at no additional cost to the Owner.

### 3.5 SOIL PREPARATION FOR PLANTING PITS OF TREES

- A. This article pertains to tree planting when occurring on an individual basis.
  - 1. Backfill Mix: Prepare backfill mix and place in planting pits as specified in Division 32 Section "Plants."
  - 2. Grade smooth to elevations shown.

### 3.6 SOIL PREPARATION UNDER EXISTING TREES

- A. Remove vegetation not indicated to remain beneath canopy of existing trees. Take care not to disturb roots of existing trees.
- B. Lightly rake areas and add amended topsoil to meet proposed grades.

**3.7 FINE GRADING**

- A. Finish grade after full settlement including mulch, shall be 1 inch below tops of curbs, walks, or existing grades in shrub areas and 3/4 inch lower in lawn areas.
- B. Slope all areas to prevent puddling and drain surface water toward catch basins, drains, curbs, or off-site as shown on Drawings.
- C. Soil in all areas shall be thoroughly settled, with a smooth surface free of humps and hollows, and shall be firm enough to resist undesirable impressions when stepped upon.
- D. Use levels, screens, drags, or any other equipment necessary to establish and verify grades and surfaces.
- E. Finish grade lawn, grass and planting areas to smooth, even surface with loose, uniformly fine texture.
- F. Roll, rake, and drag lawn areas, remove ridges and fill depressions with amended topsoil to obtain firmness and finish grades as indicated.
- G. Notify Owner's Representative 36 hours in advance to review fine grading of lawn, grass and planting areas. Finish grades shall be prepared to the satisfaction of the Owner's Representative prior to planting.
- H. See Division 32 Section "Plants," for mulch placement.

**3.8 CLEAN-UP**

- A. Clean up excess materials and debris from project site upon completion of work or sooner if directed by the Owner's Representative.
- B. Leave in neat and tidy condition daily.

**3.9 DISPOSAL**

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 32 9113

**SECTION 32 9200 - LAWN AND GRASSES****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Seeding.
2. Lawn renovation.
3. Herbicides.

**B. Related sections include the following:**

1. Division 32 Section "Soil Preparation," for topsoil and preparation requirements for new lawns and grasses.
2. Division 32 Section "Plants" for planting bed border edgings.
3. Division 32 Section "Establishment Maintenance" for maintenance of new plantings after Substantial Completion.

**1.2 GENERAL REQUIREMENTS**

- A. Comply with governing regulations applicable to landscape materials.
- B. Do not make substitutions. If specified landscape material is not obtainable, submit to the Owner's Representative proof of non-availability and material proposed for use as equivalent material.
- C. Proceed with and complete the landscape work as rapidly as portions of the site become available, working within the seasonal limitation for each kind of landscape work required.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Submit within 30 days from Award of Contract the following:
  1. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
  2. Vendor's proof of order for each seed mix specified. Deliver the seed bag tags to Owner's Representative.
  3. Fertilizers: Submit manufacturer's guaranteed analysis.
  4. Mulch: Submit samples and vendor's product certificates for top dressing mulch.

5. Certification of each seed mixture for sod, identifying source, including name and telephone number of supplier.
6. Submit copy of herbicide applicator's Commercial Applicator's License to Owner's Representative before application of herbicides (includes pesticides). Submit a copy of the application record to the Owner's Representative immediately after each herbicide or pesticide application.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn establishment.
  1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.
- B. Sod: Harvest, deliver, store, and handle sod according to requirements in TPI's "Specifications for Lawnglass Sod Materials" and "Specifications for Lawnglass Sod Transplanting and Installation" in its "Guideline Specifications to Lawnglass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

#### 1.6 PROJECT CONDITIONS

- A. Coordinate work with installation of other site work including irrigation and planting.
- B. Verify site conditions that will not adversely affect execution. Verify that soil preparation has been completed and irrigation systems have been installed.
- C. Architect shall determine areas beyond those shown on Drawings disturbed by construction that are to be prepared and seeded at no additional cost to the Owner.
- D. Observe the conditions under which Work is to be performed, and notify the Owner's Representative of unsatisfactory conditions. When conditions detrimental to lawn growth are encountered, such as rubble, rock fill or adverse drainage conditions, notify the Owner's Representative before planting or adding soil amendments. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Owner's Representative. Should any conditions not mentioned on the Drawings be found to exist, notify the Owner's Representative immediately.
- E. Environmental Requirements: Do not place, spread, or roll fill materials during unfavorable weather conditions. When work is interrupted by adverse weather conditions, do not resume fill operations until moisture content and density of fill are satisfactory.

- F. Protection of subgrade: Do not allow equipment to pump or rut subgrade, stripped areas, footing excavations or other areas prepared for the Project. Protect subgrades, fills and excavation areas from surface waters flowing into the work areas.
- G. Season: Seeding shall take place in normal weather and temperatures that are appropriate and typical for such work between April 1st and September 15th. Seeding on other dates or during adverse conditions is at the risk of the Contractor. Do not sow seed when weather conditions are unfavorable, such as during drought, heavy rain or high winds.
- H. Continuity of Soil Preparation and Seeding: Proper establishment of lawn requires that seeding occur as soon as practicable after completion of fine grading. A properly cultivated and finely graded soil surface can be jeopardized or damaged if allowed to lie fallow or unseeded. Seeding shall therefore begin within 72 hours of approval of final grades. If rainfalls of greater accumulation than 0.25-inches occur within this time period, then the soil surface shall be examined after drying to determine if glazing or crusting has occurred. Any seedbed areas greater than 6-inches in any dimension which appear smooth or glazed shall be recultivated. If glazing is apparent throughout the seedbed area, the entire surface shall be cultivated or raked again to establish a friable soil surface. If seeding is delayed for more than 72 hours, recultivation and raking for finish grade shall also be required if puddling or glazing of the soil surface is apparent. Any and all reraking and supplemental cultivation shall be considered as incidental to the project Work and shall be performed at no additional cost to the Owner.

#### 1.7 PROTECTION

- A. Provide adequate measures to protect workers and passers-by the site. Execute all work in an orderly and careful manner with due consideration for any and all surrounding areas, plantings, or structures which are to remain. Protect all adjacent property and improvements from work damage, and replace any portions damaged.
- B. Any structures or facilities damaged due to Work of this Section shall be restored equal or better to their original condition at Contractor's expense and to the satisfaction of the Owner's Representative at no additional cost to the Owner.

#### 1.8 WARRANTY

- A. Guarantee seeded lawns and grasses in writing for a period of 1 year, or to the end of one full growing season after date of Final Acceptance, whichever is longer. Maintain and protect seeded lawns and grasses from damage until date of Final Acceptance. This shall include damage caused by vandalism or adverse weather conditions.
- B. Remove and replace seeded lawns and grasses found to be dead, having low germination or growth rates, or in unhealthy condition during and at the end of warranty period. All replacement work shall be made within 14 days after receiving notification by the Owner's Representative, weather permitting. Provide new seeded lawns and grasses which comply with the Drawings and specifications, at no additional cost to the Owner. Guarantee replacement seeded lawns and grasses for 1 year from the date of seeding as specified above.

- C. In the event the Contractor does not make repairs accordingly, the Owner without further notice may provide materials and labor to make such repairs at the expense of the Contractor at no additional cost to the Owner.

## PART 2 - PRODUCTS

### 2.1 SEED

- A. General: provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America.
- B. Grass Seed Mix: Subject to compliance with requirements, provide the following proprietary seed mixes:
1. Finish Lawn Seed: Hobbs & Hopkins Ltd. "Pro-Time 2000", Portland, Oregon (503) 239-7518. Application rate: 8 pounds per 1000 square feet.

### 2.2 SOD

- A. Sod: Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with TPI's "Specifications for Lawnglass Sod Materials" in its "Guideline Specifications to Lawnglass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
- B. Grass Species: Sod of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:
1. JB Instant Lawn, "Signature" sod, perennial ryegrass 3-way cultivar blend, Salem, Oregon 800-527-1439.

### 2.3 TOPSOIL

- A. Topsoil: See Division 32 Section "Soil Preparation."

### 2.4 INORGANIC SOIL AMENDMENTS

- A. Inorganic Soil Amendments: See Division 32 Section "Soil Preparation."

### 2.5 ORGANIC SOIL AMENDMENTS

- A. See Division 32 Section "Soil Preparation."

## 2.6 TOP DRESSING

- A. Top dressing for hand seeding small areas where machine seeding is not feasible (not needed with seeding machine or hydroseeding):
  - 1. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed peat moss, having a water-absorbing capacity of 1100 to 2000 percent.
  - 2. Compost: See Division 32 Section "Soil Preparation."

## 2.7 HERBICIDES

- A. Post-Emergent Herbicides: EPA registered and approved, of type recommended by manufacturer for selective weed eradication. "Glyphogan PlusRound-Up" by Mana, "Envoy Plus" by Valent, "Crossbow" by Dow AgroSciences, "Landmaster BW" by Agri Star or approved equal.
- B. Pre-Emergent Herbicides: EPA registered and approved, of type recommended by manufacturer for selective weed prevention. "Ronstar-G" by Bayer, "Dimension EC" by Dow AgroScience, or equal. Products containing either pendimethalin or DCPA are prohibited.

## 2.8 FERTILIZER

- A. Meet requirements of applicable State fertilizer laws. Fertilizers shall be uniform in composition, dry and free flowing. Deliver to the site in original unopened containers each bearing manufacturer's guaranteed analysis.
- B. Composition and rate of fertilizer used to amend topsoil is to be determined by soil analyses. Refer to Division 32 Section "Soil Preparation" for soil fertility testing requirements.
- C. Commercial Fertilizer: Slow release, granular fertilizer that is derived from natural organic and inorganic sources.
  - 1. Starter Fertilizer: Woodburn Fertilizer 'Perfection Mix #29' 15-15-15 w/Minors, as available from Woodburn Fertilizer, Woodburn; Oregon; Tel.: 1-503 981 3521, or equal
  - 2. Maintenance Fertilizer: Woodburn Fertilizer 'Regal Green' 21-4-21 with 50 percent of the nitrogen controlled release from superior Duration™ Type II, as available from Woodburn Fertilizer, Woodburn, Oregon; Tel.: 1-503 981 3521, or equal.

## 2.9 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

- B. Peat Mulch: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed peat moss, having a water-absorbing capacity of 1100 to 2000 percent.
- C. Compost Mulch: See Division 32 Section "Soil Preparation."

## 2.10 TEMPORARY BARRICADE MATERIALS

- A. Agricultural metal stakes, minimum 42-inch exposed height.
- B. Twine or wire.
- C. Plastic flagging tape, 12-inch lengths.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
  - 1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
  - 2. Protect grade stakes set by others until directed to remove them.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

## 3.3 LAWN AREA PREPARATION

- A. See Division 32 Section "Soil Preparation."

## 3.4 SEEDING NEW LAWNS

- A. Notify Owner's Representative for approval of seed bed prior to seeding.
- B. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.

- C. Apply Starter Fertilizer at a rate of 1 pound of actual Nitrogen per 1,000 square feet immediately prior to sowing seed. Do not sow seed and fertilizer simultaneously.
  - 1. Include Starter Fertilizer in hydroslurry mix.
- D. Sow seed using a drill seeding machine that places seed into soil. Do not seed when wind velocity exceeds 5 miles per hour. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
  - 1. For small areas where seeding machine is not feasible, use seed broadcaster and hand rake seed into soil.
  - 2. For slope areas greater than 3 to 1 gradient of slope, use hydroseeding application.
- E. Finish Lawn: sow seed mixture at 8 lbs. per 1,000 Square feet; water thoroughly.
- F. Protect seeded areas with slopes with a gradient not exceeding 4 horizontal to 1 vertical by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.
  - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
- G. Top Dressing: (not needed with seeding machine or hydroseeding). Protect hand seeded areas from hot, dry weather or drying winds by applying compost mulch or peat mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a depth of 3/16 inch , and roll surface smooth. Cover area evenly with top dressing at the rate of two 4-cubic foot peat moss bales per 1,000 S.F. of area, or equivalent density cover with compost.
- H. Reseeding: Reseed areas failing to show uniform stands of grass at 10-day intervals until a satisfactory stand is achieved.

### 3.5 LAWN RENOVATION

- A. Renovate existing lawn.
- B. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
  - 1. Reestablish lawn where settlement or washouts occur or where minor regrading is required.
  - 2. Prepare planting soil as specified in Division 32 Section "Soil Preparation."
- C. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury in soil.
- D. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new planting soil.
- E. Mow, dethatch, core aerate, and rake existing lawn.

- F. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and lawn, and legally dispose of them off Owner's property.
- H. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.
- I. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top 6 inches of existing soil. Provide new planting soil to fill low spots and meet finish grades.
- J. Apply seed and protect with mulch as required for new lawns.
- K. Water newly planted areas and keep moist until new lawn is established.

### 3.6 LAWN MAINTENANCE

- A. Maintain and establish lawn by watering, fertilizing, weeding, mowing, edging, trimming, replanting, and other operations necessary to establish a stand of grass to the satisfaction of the Owner's Representative. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.
  - 1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
- B. Weed Eradication: Remove germinated lawn seed in planting areas without harming other plant material. Spray under and 6 inches outside of fences with "Roundup" to kill all grasses and weeds.
- C. Duration: Maintenance of the seeded lawn shall commence after preliminary observation and approval of the seed bed by the Owner's Representative, and continue for a period of 60 calendar days minimum after written Notice of Substantial Completion of the Project and until Final Acceptance, whichever is later.
- D. Establishment: If lawns are not established before the dormant period, maintain for a period of 60 calendar days minimum after the dormant period and until Final Acceptance. The dormant period is November 15th to March 1st.
- E. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist to a depth of 4 inches.
  - 1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
  - 2. Water lawn with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

F. Mowing: Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. All grass clippings shall be collected and disposed of off-site in a legal manner. Schedule initial and subsequent mowings to maintain the following grass height:

1. Finish Lawn: Once growth has reached 4 inches, mow and cut no more than 1/3 total height of grass. Mow weekly thereafter to maintain a height of 2 inches. Maintain until Final Acceptance.
2. Rough Lawn: Once growth has reached 6 inches, mow and cut no more than 1/3 total height of grass. Mow weekly thereafter to maintain a height of 3 inches. Maintain until Final Acceptance.

G. Lawn Postfertilization: Apply fertilizer after initial mowing and when grass is dry.

1. Fertilize lawns at end of 30 days with Maintenance Fertilizer at the rate of 1 pound per 1,000 square feet.
2. Continue fertilizing lawns at 30 days intervals with Maintenance Fertilizer at the rate of 1 pound per 1,000 square feet until the end of the Maintenance Period.

### 3.7 SATISFACTORY LAWNS

- A. Lawn installations shall meet the following criteria as determined by the Owner's Representative:
1. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, dense stand of grass has been established, free of weeds and surface irregularities, humps and depressions, with coverage exceeding 95 percent over any 10 sq. ft. and bare spots not exceeding 2 by 2 inches.
  2. Satisfactory Sodded Lawn: At end of maintenance period, a healthy, well-rooted, even-colored, viable lawn has been established, free of weeds, open joints, bare areas, and surface irregularities.
- B. Ensure that seed establishment occurs prior to October 15. Lawns that are not satisfactorily established at this time shall be sodded at no additional cost the Owner.
- C. Where observed landscape work does not comply with the requirements, replace rejected work and use specified materials to reestablish lawns and continue maintenance until lawns are satisfactory.

### 3.8 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris, created by lawn work, from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from foot and vehicular traffic and to protect against trespassing and damage.

Maintain fencing and barricades throughout initial maintenance period and remove after lawn is established.

- C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 32 9200

**SECTION 32 9300 – PLANTS****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Trees.
2. Shrubs.
3. Ground Cover.
4. Plants.
5. Herbicide.
6. Planting Fertilizers.
7. Mulches.
8. Root Barriers.
9. Tree Stabilization.
10. Planting Accessories.

**B. Related Sections:**

1. Division 01 Section "Temporary Tree and Plant Protection" for protection of existing trees and plantings] and root pruning of existing trees.
2. Division 31 Section "Earth Moving" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.
3. Division 32 Section "Soil Preparation" for preparation of planting soils.
4. Division 32 Section "Lawn and Grasses" for lawn and meadow planting.
5. Division 32 Section "Establishment Maintenance" for maintenance of plants during the maintenance period.

**1.2 REFERENCES****A. Standards:** Comply with botanical names, sizes, and conditions provided in:

1. Botanical Names: American Joint Committee on Horticultural Nomenclature, "Standardized Plant Names."
2. Sizes and Conditions: ANSI Z60.1 "American Standards for Nursery Stock", (latest edition).
3. Perennials: "Perennial Plant Association Standards."
4. Native Species: Hitchcock, C.L. and A. Cronquist, "Flora of the Pacific Northwest," 1973.

**1.3 QUALITY ASSURANCE**

- A. Contractor: Provide one person who shall: Be present at all times during execution of work in this section; be familiar with the materials and best methods for installation; direct work performed under this section.
- B. Government Inspection: All plants and planting material shall meet or exceed the specifications of Federal, State, and County laws requiring inspection for plant disease and control.
- C. Secure plant material and maintain in a climate similar to that of the project site for a minimum period of one year.
- D. All plant material to be grown from cuttings or seed. Collected plants are not acceptable.

#### 1.4 SUBMITTALS

- A. Within 30 days after Contract award, submit:
  - 1. A list of local/regional suppliers for each plant species to be installed. List to include plant quantities, sizes and root conditions. Certify in writing, confirmed orders for plants by submitting a Bill of Sale for each plant to be installed. Each plant species shall be supplied by one grower only unless otherwise approved by Owner's Representative.
    - a. Requests for substitutions of plants not available in size, quantity or type specified must be made within 30 days after Contract award. Submit written evidence that a specified plant cannot be obtained and has been unobtainable since Contract award.
  - 2. Plant Material Inspection Certificates for all plant material shipped from out of state.
  - 3. 1/2 cubic foot samples each, of bark and stone mulch for approval prior to delivery.
  - 4. Product Data: For the following:
    - a. Mulch.
    - b. Anti-desiccant.
    - c. Post-emergent herbicide.
    - d. Tree stabilization products.
    - e. Root barriers.
  - 5. Submit copy of herbicide applicator's Commercial Applicator's License to Owner's Representative before application of herbicides (includes pesticides). Submit a copy of the application record to the Owner's Representative immediately after each herbicide or pesticide application.
- B. Shrub and Tree Samples: Typical samples, three each of all varieties and sizes (# 5 and under for shrubs, # 15 and under for trees) of all plant materials shall be submitted for inspection approval at the job site a minimum of fifteen (15) days prior to planting operations. Each sample shall be clearly labeled as to species, variety and nursery source. Approved samples shall remain on site and shall be maintained by the Contractor as

standards of comparison for plant materials to be furnished. Approved samples shall be incorporated into the work.

- C. Upon completion of the Work, submit:
  - 1. Written notification to Owner's Representative requesting review for Substantial Completion.
  - 2. Written notification to Owner's Representative of Punch List Completion.
- D. With application for final payment, submit:
  - 1. Duplicate copies of delivery invoices, labels, or other acceptable proof of quantities of materials used.
  - 2. Copies of delivery invoices, labels, or other proof of quantities of plant materials and fertilizers.

#### 1.5 SITE OBSERVATION

- A. Site observations herein specified shall be made by the Owner's Representative. The Contractor shall provide a minimum of three (3) days' notice before Observation is required.
  - 1. Pre-Construction Meeting: Explain Owner Representative's role to Contractor, review construction sequence.
  - 2. Upon the completion of grading prior to planting.
  - 3. Approval of samples of plant materials delivered to site.
  - 4. When trees and shrubs are spotted in place for planting, but before planting holes are excavated.
  - 5. Final Observation—Final Acceptance—at the completion of the ninety (90) day Maintenance Period. Successful completion of this observation shall establish the beginning date for the one (1) year guarantee of all trees.
- B. Construction Observation visits shall be made in proper sequence with the installation of work. No sites visits shall occur until all soil submittals have been made and approved. The Landscape Contractor shall be responsible for reimbursement of time and travel expenses at current billing rates, incurred by the Architect due to out of sequence site visits.
- C. Contractor shall speak English and be on site at the time of each observation.
- D. No site visits shall occur until all items in previous Observation Reports have been completed or remedied unless the Owner has waived such compliance in writing.
- E. Upon completion of the Final Observation and the Work of this Section, the Contractor will be notified in writing: (1) whether the work is acceptable; and (2) of any requirements or corrective measures necessary for completion and acceptance in the form of a Punch List.

- F. Failure to execute completion of the Punch List requirements shall make the Landscape Contractor responsible for reimbursement of time and travel expenses at current billing rates incurred by the Architect.

#### 1.6 QUALITY CONTROL

- A. Inspection: Plants shall be subject to inspection by the Owner's Representative at the place of growth and upon delivery to the project site. Approval at the supplying nursery shall not preclude the right of inspection and rejection at the time of delivery to the project site or during progress of the work. Plants not conforming to specification requirements at any of these times will be rejected and replaced with new acceptable plants at the Contractor's expense.
- B. The presence of noxious weeds in plant balls shall be cause for rejection of any or all plants from that source.

#### 1.7 DELIVERY

- A. Deliver packaged materials to site in original unopened containers bearing manufacturer's guarantee chemical analysis, name, trade name, and trademark.
- B. Remove unacceptable plant material immediately from project site.
- C. Plant Materials:
1. Deliver trees and shrubs after preparations for planting have been completed, and plant immediately.
  2. Do not prune prior to delivery unless otherwise approved by Owner's Representative.
  3. Do not bend or bind-tie trees or shrubs in such a manner as to damage bark, break branches, or central leader, or destroy natural shape.
  4. Provide protective covering during delivery.
  5. Protect plants during delivery to prevent damage to root ball or desiccation of leaves.
  6. Apply anti-desiccant using a pump sprayer to provide adequate film over trunks, branches, stems, twigs and foliage of plants.
  7. If deciduous trees or shrubs are moved in full-leaf, spray with anti-desiccant at nursery before moving, and sprayed again 2 weeks after planting.
  8. Label one of each tree and shrub species with securely attached waterproof tag bearing botanical name and supplier's name.

#### 1.8 STORAGE

- A. Contractors shall schedule and conduct planting operations to minimize storage of plant materials on the project site. The location and conditions of storage shall be reviewed for approval by the Contractor, Owner, and Owner's Representative.

B. Plants that cannot be planted within one day after arrival shall be "heeled-in" in accordance with accepted horticultural practices and the following requirements:

1. Protect root ball of balled and burlapped plants with moist earth, sawdust or other acceptable material.
2. Protect plant at all times from injury, extreme weather conditions, and keep moist.
3. Store plants in shade until planted.
4. Store plants in upright position and allow sufficient ventilation.

C. All plants that are to be stored longer than one month shall be planted in nursery rows and maintained at Contractor's expense.

#### 1.9 HANDLING

- A. Do not drop plants.
- B. Do not pick up container or balled plants by stems, trunk, or foliage. Handle balled & burlapped plants by the ball of earth.

#### 1.10 NOTIFICATIONS

- A. Notify Owner's Representative a minimum of 48 hours in advance of plant material delivery so that plants may be inspected upon site delivery. Unapproved materials to be immediately removed from job site.
- B. Notify Owner's Representative a minimum of one week in advance for request of Substantial Completion and Final Acceptance inspections.

#### 1.11 SITE CONDITIONS

- A. Existing Improvements to Remain: Locate underground utilities prior to start of work.
- B. Protect existing improvements from damage, soiling or discoloration. Repair or replace damaged, soiled or discolored improvements as directed by Owner's Representative.
- C. Planting Conditions: Planting not permitted during the following conditions, unless otherwise approved:
  1. Cold weather: less than 32 degrees Fahrenheit.
  2. Hot weather: greater than 90 degrees Fahrenheit.
  3. Wet weather: saturated soil.
  4. Windy weather: wind velocity greater than 20 m.p.h.

#### 1.12 WARRANTY

- A. Warrant all plant material to be true to botanical name and specified size.

- B. After receiving notice of Substantial Completion, maintain all plant material in a vigorous condition for 90 days as outlined in Division 32 Section "Establishment Maintenance".
- C. Immediately replace plant material which is dead, not surviving or in poor condition in accordance with these specifications during current or if necessary, next planting season and at no cost to the Owner for a period of one year from the date of Substantial Completion. Contractor shall provide, at his expense, a timely written diagnosis of plant health by a certified Arborist, should a dispute arise concerning plant vitality or viability. Arborist's report shall indicate reason for lack of vigor, potential remedies, if any, and estimated time required to regain vigor and specified size.
- D. Plants used for replacement shall be the same variety as originally specified. Replacement plant size shall match the physical size of the adjacent, healthy plants of the same species at the time of replacement. Replacement plants shall be furnished, planted and fertilized as originally specified.
- E. Contractor shall repair at no additional cost to the Owner, all damage to vegetation, site improvements and property caused by replacement of plant materials during the Maintenance Period.

#### 1.13 ACCEPTANCE

- A. Substantial Completion:
  - 1. Notify the Owner's Representative in writing of the completion of planting and ancillary landscape work.
  - 2. Within 10 days after notification of completion of work, the Owner's Representative will inspect the work and prepare a Notice of Substantial Completion, along with a Punch List identifying items that require completion or correction.
  - 3. Notice of Substantial Completion constitutes the commencement of the Maintenance Period.
- B. Final Acceptance:
  - 1. Final inspection of all planting will be made by the Owner, Owner's Representative and the Contractor. Prior to executing a final inspection, the Contractor must furnish the Owner's Representative with written documentation identifying how each Punch List item has been corrected. If such written documentation is not provided to the Owner's Representative, all requirements of the Maintenance Period shall remain in force indefinitely until such time as the written documentation is received. Any extension of the Maintenance Period due to the failure of the Contractor providing written documentation of Punch List completion will be considered incidental to the Work and shall be performed by the Contractor at no additional cost to the Owner.
  - 2. Before Final Acceptance is granted the following must be completed by the Contractor and receive approval from the Owner's Representative:
    - a. Written documentation identifying how each item on the Punch List has been corrected.

- b. Replacement planting and correction of all items identified on the Punch List prior to expiration of the specified Maintenance Period.
  - c. The project site must meet all conditions stipulated within the "Maintenance" and "Clean Up and Protection" sections of the specifications.
3. If Final Acceptance is not granted at the end of the specified Maintenance Period, the Contractor shall continue maintaining plantings until Final Acceptance is granted, at no additional cost to the Owner.
- C. Necessary Observations Beyond Final Acceptance:
- 1. If any of the items identified on the Notice of Substantial Completion and Punch List have not been fully corrected or repaired to the complete satisfaction of the Owner's Representative, the Contractor must schedule a field observation to substantiate claim of correction. The Contractor shall bear financial responsibility to reimburse the Owner for all time and travel costs incurred by the Owner's Representative to confirm Punch List compliance.

## PART 2 - PRODUCTS

### 2.1 PLANT MATERIALS

- A. Provide plant materials as scheduled on Drawings.
- B. Quantities indicated are for Contractor's convenience only. Contractor to verify all plant quantities and provide number of plants required to complete work graphically shown on Drawings.
- C. Sizes and grade quality are maximums as listed. Larger sizes are not acceptable.
- D. Plants shall be vigorous, well-formed and shaped, true to species and type. Plants shall be free from disease, insects, and defects such as knots, girdled or circling roots, poor branch attachment, sun-scald, windburn, injuries, abrasion, significant trunk scars, or other objectionable disfigurements.
- E. Plants shall not be pruned prior to delivery.
- F. Plants shall be full foliaged when in-leaf.
- G. Trees with damaged or crooked leaders, co-dominant leaders, or multiple leaders - unless specified; will be rejected.
- H. Christmas tree stock shall not be used for conifer, evergreen material.
- I. Conform to ANSI Z60.1, with additions and exceptions noted:
  - 1. Containerized Plants: Grown in container in which delivered for at least 3 months, but not root-bound. Root bound plants will be rejected.
  - 2. Greenhouse Grown Plants: Acclimated outdoors for 360 days prior to delivery.

3. Balled and Burlapped Plants and Containerized Trees: All evergreen trees and deciduous trees over 1-1/2 inch caliper to be balled and burlapped with hemp burlap and twine only or grown in container in which delivered for 9 months minimum. Soil balls to be a minimum of 10 inches per caliper inch of tree. The root flare shall be exposed at the top of the rootball; trees with the root flare concealed within the rootball or exhibiting evidence of soil previously covering the flare will be cause for rejection.
4. Trees: Straight-single trunked and not varying from plumb more than 6 inches over 6 feet. Well-branched with radial branching distributed equally around the trunk, no cross branches, narrow crotched branching, bark inclusions or broken major branches. No dead or broken leaders, fresh cuts over 1 inch diameter and no evidence of being "topped" or sheared. Trees shall have a single trunk unless specified otherwise.
5. Grafted Trees: Base grafted or budded only.

## 2.2 HERBICIDES

- A. Post-Emergent Herbicides: EPA registered and approved, of type recommended by manufacturer for selective herbicide application. "Glyphogan PlusRound-Up" by Mana, "Envoy Plus" by Valent, "Crossbow" by Dow AgroSciences, "Landmaster BW" by Agri Star or approved equal.
- B. Pre-Emergent Herbicides: EPA registered and approved, of type recommended by manufacturer for selective weed prevention. "Ronstar-G" by Bayer, "Dimension EC" by Dow AgroScience, or equal. Products containing either pendimethalin or DCPA are prohibited.

## 2.3 PRE-PLANT FERTILIZER

- A. (1-10-10) shall be a combination of natural organic and inorganic granular fertilizers, free-flowing, and shall contain the following minimum available percentage by weight of plant food:

Nitrogen	1.0% minimum
Phosphoric Acid	10.0% minimum
Potash	10.0% minimum

## 2.4 POST-PLANT FERTILIZER

- A. (7-9-4) shall be a long-lasting, organic and controlled release plastic-coated, uniform in composition, free-flowing and shall contain the following minimum available percentages by weight of plant food.

Nitrogen	7.0% minimum
Phosphoric Acid	9.0% minimum
Potash	4.0% minimum

## 2.5 MULCH

- A. Wood Mulch: Provide standard, commercially produced, medium-course, dark brown, bark mulch. Bark shall be ground Fir or Hemlock bark of uniform color, free from weeds, seed, sawdust, and splinters and shall not contain resin, tannin, or other compounds detrimental to plant life. All material shall pass a 1-inch mesh screen.

**2.6 ANTI-DESSICANT**

- A. Emulsion type, film-forming agent designed to permit plant transpiration but retard excessive loss of moisture from plants. "Wilt-Pruf" or equal.

**2.7 PLANTING SOIL MIXES**

- A. Refer to Division 32 Section "Soil Preparation."

**2.8 TREE STAKING AND GUYING**

- A. Deciduous Tree Tie: Plastic chain-type, minimum 1 inch wide by 1/8 inch thick.
- B. Evergreen Tree Guy Wire: 12 gauge galvanized wire with 1/2 inch rubber hose collar, black color, to protect tree trunk.
- C. Stakes: 2 inch x 2 inch x 8 feet Douglas fir for staking of deciduous trees; and 2 inch x 2 inch x 36 inch Douglas fir for guying of coniferous trees. Stain [dark] brown with water-based commercial wood stain prior to installation.
- D. Provide miscellaneous hardware, wire, and accessories as shown on the Drawings.
- E. PVC Flags: 1/2 inch or 3/4 inch diameter x 36 inches long PVC pipe.

**2.9 ROOT BARRIERS**

- A. Rigid interlocking polypropylene panels: Deep Root, Inc; or equal.
1. Root control barriers: 24 inches deep by 0.08 inch thick polyethylene panel with integral root directing ribs and self locking joiner strips. Model No. UB 24-2.

**2.10 FILTER FABRIC**

- A. Non-woven filter fabric to cover drain rock: Mirafi 140N as available from TenCate, (360) 699-1426; Propex 451 as available from A.C.F. West Inc., (503) 771-5115; or equal.

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Verify finish grades are properly achieved and soil preparation has been completed in accordance with the specifications; start of Work denotes acceptance by the Contractor and Contractor assumes responsibility for final results.

### 3.2 SOIL PREPARATION

- A. As specified in Division 32 Section "Soil Preparation".

### 3.3 LAYOUT

- A. Mark locations of lines between the planting areas and the lawn areas on the finish with paint, chalk or equal material for approval by the Owner's Representative. The method of marking shall be approved by the Owner's Representative.
- B. Mark locations of trees and shrubs for approval by the Owner's Representative prior to digging. The method of marking shall be approved by the Owner's Representative. After approval of layout, field place trees and shrubs in locations shown on Drawings. Owner's Representative may request rotation or slight movement of tree to give a better appearance with respect to adjacent plants and structures. Placement must meet approval of Owner's Representative prior to excavating planting pits.

### 3.4 EXCAVATION FOR TREES AND SHRUBS

- A. Excavate planting holes, with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Loosen hard subsoil in bottom of excavation and deeply scarify vertical sides.
- B. For trees and shrubs, make excavations at least 2 times wider than root spread; equal to the rootball height directly beneath the rootball; and 1-1/2 times deeper than rootball height around the perimeter of the planting pit, as indicated in the Drawings.
- C. Test tree pits for percolation by filling entire pit with water and allow to stand for a period of twenty-four (24) hours. Notify the Owners Representative of all tree pits with water remaining at the end of the twenty-four (24) hour waiting period. Auger drill an 8 inch diameter hole to a minimum depth of 36 inches at the base of all tree pits with remaining water. Fill hole with drainage backfill and cover top with filter fabric. Notify Owner's Representative for review and approval prior to planting.
- D. If conditions detrimental to plant growth are encountered, such as rubble fill, or obstructions, notify Owner's Representative and resolve before planting.
- E. Scarify bottom and sides of hole with shovel to depth of two inches eliminating "glazed" surfaces.
- F. Set plants on native soil where possible.

### 3.5 PLACING

- A. Set top of root ball slightly higher than finish grade with root flare fully exposed; deep planting is not permitted. If hole for trees is too deep, fill hole with native soil only where applicable or prepared soil to correct levels.
- B. Set plants plumb and faced for best appearance.
- C. Remove wire baskets, burlap, fasteners from rootball completely if rootball will not be damaged. If damage is suspected, notify Owner's Representative for concurrence and remove tops and sides of baskets minimum. Use bolt cutters on wire if necessary to remove wire baskets. Bending back not acceptable. Remove all burlap and twine from planting pit.
- D. Remove metal cans or plastic containers completely from rootball.
- E. Neatly cut off broken, girdling, or frayed roots and any root growth growing in a circular manner conforming to its container.

### 3.6 BACKFILLING - General

- A. Before mixing, clean topsoil of extraneous materials and other materials harmful or toxic to plant growth.
- B. Prepare planting backfill soil mix prior to backfilling. Stockpile on site.
- C. Planting backfill soil mix shall be as follows: **[1/4]** compost material, **[1/4]** amended topsoil and **[1/2]** soil excavated from planting pit.
  - 1. For the following group of plant materials, include peat moss as part of the backfill mix: Azalea spp., Camellia spp., Kalmia spp., Pieris spp., Rhododendron spp.
  - 2. The modified backfill mixture schedule for these plants shall be of the following ratio:
    - a. **[1/4]** compost material, **[1/4]** topsoil, **[1/4]** peat moss and **[1/4]** soil excavated from planting pit.
- D. Backfill half of plant pit around rootball with backfill soil mix, carefully tamp soil around rootballs.
- E. Add 3 ounces mycorrhizal inoculum per caliper-inch to backfill around trees. Add 3 tablespoons mycorrhizal inoculum per gallon planting size. Add 1 teaspoon mycorrhizal inoculum per ground cover plant.
- F. Complete backfilling, firming to surface grade.
- G. Form watering basin from site topsoil as shown on Drawings.
- H. Thoroughly hand water each plant and entire bed immediately after planting. Adjust rootball and soil as required if settlement of soil occurs.
- I. Remove plant tags and ribbons.

**3.7 PLANTING TREES AND SHRUBS**

- A. Set roots or rootball on layer of compacted planting soil backfill mix or native suitable topsoil from planting pit, plumb and in center of pit or trench with top of rootball at 1 inch above elevation of adjacent finished grade.
- B. Place additional planting soil backfill mix around base and sides of ball and eliminate voids and air pockets. When backfill is approximately 2/3 complete, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill. Cut burlap from top of rootball and roll back to sides of planting hole; form watering basin; stake and guy immediately after planting.
- C. After planting, apply fertilizer at the following rates:  
0-1 foot tall shrub = 0.4 oz.  
1-2 foot tall shrub = 0.8 oz.  
2-4 foot tall shrub or tree = 1.75 oz.  
4-8 foot tall shrub or tree = 4 oz.  
8+ feet = 4 oz. plus proportional amount per foot.

**3.8 ROOT CONTROL BARRIERS AT NEW PLANTINGS**

- A. Provide linear and surround root barrier applications at trees within 5 feet of paving, curbs, walls, utility ducts or other appurtenances.
  1. For linear applications provide sufficient lengths of panels to equal mature width of tree canopy plus 2 feet, 10 feet minimum length. Provide on both sides of the tree trunk adjacent to curb and paving per manufacturer's recommendations.
  2. For surround applications provide a minimum of five 24-inch long panels where trees are planted on an individual basis. Shape connected panels to form an oval around the tree rootball.
- B. Excavate planting hole as specified for tree planting.
- C. Begin backfilling with soil mix and install tree as specified. Backfill up to depth equal to depth of root control barrier panel. Install interlocking root control panels around rootball, with minimum 8 inches clearance to rootball and with top 1/2 inch above finish grade.
- D. Backfill around rootball with planting soil backfill mix as specified for tree planting. Backfill outside of root control barriers with 3/4 to 1-1/2-inch crushed gravel, no fines (not pea gravel), to full depth of panels and minimum 4 inch wide area.

**3.9 LINEAR ROOT CONTROL BARRIERS AT EXISTING TREES**

- A. Provide at locations shown on the Drawings and as approved by the Owner's Representative. Excavate 24 inches deep trench along edge of proposed pavement. Install trench and barrier prior to pouring concrete or laying of pavers. Re-compact pavement subgrades and bases encountered during installation of root barriers. Cut any existing roots

squarely according to Arborist's standard horticultural practices and root barrier manufacturer's recommendations.

- B. Install panels vertically, with ribs on tree side of barrier, to be flush against proposed paving, maximum 2 inches below top of paving, and 1/2 above finish grade. If panels cannot be installed immediately against paving formwork, backfill paving side of panel with 1-inch minus crushed rock to keep panel vertical and stabilized.
- C. Provide minimum 10-foot length of connected panels, centered on tree trunk or existing root, as directed by Owner's Representative. Backfill tree side of barrier with planting backfill soil mix. (See "Planting Trees and Shrubs" article above.)

### 3.10 STAKING

- A. Deciduous Trees 1-inch caliper and larger: Provide 2 stakes per tree 180 degrees from each other in the direction of prevailing winds. Drive plumb outside of rootball as shown on Drawings. Place tree ties around tree trunk, approximately 4 feet from ground level, one from each side.

### 3.11 MULCH

- A. Place mulch **3** inches deep in all planting beds. Rake smooth. Mulch shall be pulled away from crowns of shrubs, perennials and groundcover plants. Mulch shall be flush with adjacent curbs and paving. Taper mulch thickness from full 3-inches depth to 2-inch depth over a 12-inch horizontal run at paving edges so mulch will be flush with adjacent curbs and paving.
- B. Tree Plantings in Lawns:
  1. Deciduous Trees: Cut away and remove lawn to establish a 4-foot radius circle from center of tree. Cut clean edge and fill with mulch.
  2. Coniferous Trees: Cut away and remove lawn to establish a circular ring 2 feet beyond the outside dimension of drip line of tree. Ring to be centered on tree minimum 4-foot radius. Cut clean edge and fill with mulch.
  3. For trees in pavement cut outs, provide minimum 3 inches depth of mulch.

### 3.12 PRUNING

- A. Prune plant material if necessary and as directed by Owner's Representative to balance root and top growth. Prune, thin, and shape trees and shrubs in accordance with standard horticultural practices.
- B. Prune all dead and broken limbs.
- C. Prune without distorting basic form of the plant and only to the extent necessary for each plant except where directed by Owner's Representative. Do not prune plants into boxes or balls.

**3.13 MAINTENANCE**

- A. Begin plant maintenance immediately after planting and continue until the end of the Maintenance Period or through any extensions of the Maintenance Period due to failure to supply written documentation of Punch List completion. Refer to Division 32 Section "Establishment Maintenance" for specific requirements.
- B. Store maintenance materials and equipment where directed by Owner's Representative. Keep pavements clean and work areas in an orderly condition.
- C. Maintain plants for an additional 90 days minimum after written notice of Substantial Completion of the Project and until Final Acceptance (whichever is later). If plants are not installed before the dormant period, November 15th to March 1st, maintain for a period of 90 days after the dormant period or until Final Acceptance, whichever is later.
  - 1. Inspect plants at least once a week and perform maintenance promptly.
  - 2. Maintain trees, shrubs and ground covers by watering, pruning, spraying, cultivating, and weeding as required for healthy growth.
  - 3. Water when soil moisture is below optimum level for best plant growth.
  - 4. Remove and replace impaired or dead plants promptly during specified planting season.
  - 5. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required.
  - 6. Eradicate all weeds, grass, and other undesired vegetation growth from planting areas. Remove dead weeds and dispose of legally off-site. Remove all perennial weeds completely, including all underground parts.
  - 7. Restore all soil settlement to original grade.
- D. Fertilizing and Liming: Perform as recommended in the soil fertility analysis reports and as necessary to maintain cover crop in a healthy growing condition.
  - 1. Fertilize trees, shrubs and ground cover once at the end of the Maintenance Period. Work the fertilizer thoroughly into the top 2 inches of soil.
  - 2. In March, within the first growing season, fertilize all planting areas with 1 application of each of the maintenance fertilizers, at the rate of 7 pounds per 1,000 square feet of soil surface.
- E. Hand-water plant material as indicated on Drawings for a period of 90 days during the growing season.

**3.14 CLEAN-UP AND PROTECTION**

- A. During landscape work, keep pavements clean and work area in an orderly condition.
- B. Sweep and wash paved surfaces to remove soil and soil stains.
- C. Clean all mud and debris from catch basins, which is caused by Work of this Section.

- D. Remove plant containers, trimmings, clippings, and all extraneous debris unearthed or resulting from any operations specified herein, from Project Site and dispose in a lawful manner.
- E. Protect landscape work and materials from damage.
- F. Maintain protection during installation and Maintenance Period.
- G. Treat, repair or replace damaged Work as directed by Owner's Representative, at no additional cost to the Owner.

END OF SECTION 32 9300

**SECTION 32 9500 - ESTABLISHMENT MAINTENANCE****PART 1 - GENERAL****1.1 SUMMARY**

A. Work of this section includes all labor, materials, equipment and operations to maintain all installed work as specified herein and as noted on the Drawings.

1. Maintenance of all installed work for 90 days from the date of Substantial Completion during the period of at least one growing season.

B. Related Sections:

1. Division 32 Section "Soil Preparation" for preparation of planting soils.
2. Division 01 Section "Temporary Tree and Plant Protection" for pruning of plants and trees.
3. Division 32 Section "Lawn and Grasses" for lawn and meadow planting.
4. Division 32 Section "Plants" for trees, shrubs and ground cover plantings.
5. Division 32 Section "Plants" for mulches and tree stabilization.
6. Division 32 Section "Planting Irrigation" for irrigation systems.

**1.2 OWNER'S RESPONSIBILITY**

A. Water: Owner will pay for water used for irrigation after the date of Substantial Completion.

B. Power: Owner will pay for power used by irrigation controllers after the date of Substantial Completion.

**1.3 SUBMITTALS**

A. Submit product Data and certificates showing compliance with EPA where applicable for the following:

1. Fertilizers, including application rates.
2. Herbicides, including application rates
3. Pesticides, including application rates.

B. Submit a Maintenance Schedule indicating frequency and type of maintenance work to be performed at each visit for the duration of the Maintenance Contract complying with the requirements of this Section.

C. Submit a Weed and Pest Control Plan for approval at least 30 days prior to Substantial Completion of the Work.

D. Submit a copy of the maintenance log at two-week intervals for the duration of the Project.

#### 1.4 ESTABLISHMENT AND WARRANTY PERIOD REQUIREMENTS

- A. All plant materials shall be maintained in a healthy condition until the end of the Establishment, Maintenance and Warranty Period. Replace dead and unhealthy plants immediately.
- B. All plant materials and equipment replaced under warranty shall be replaced in accordance with all provisions of the Contract Documents. Equipment shall be of the same manufacturer, model, size and quantity as originally installed. Plant material shall be of the same variety, size, and quantity as originally installed.
  - 1. Owner reserves the right to inspect plant materials replaced under warranty and reject those which do not conform to specified standards.
- C. Schedule included in this Section indicates task minimums. Contractor may perform tasks at greater frequency to comply with Contract requirements.

#### 1.5 WEED and PEST CONTROL PLAN

- A. Contractor shall submit a Weed and Pest Control Plan for approval at least 30 days prior to Substantial Completion of the work.
  - 1. The Weed and Pest Control Plan shall define all scheduled applications of herbicides and pesticides as required herein. It shall identify the applicator and license number, the names of the herbicide and pesticide products, along with the location, rate, frequency, season and method of application.
  - 2. The Contractor may submit for pre-approval the use of herbicides and pesticides to be applied on an as needed basis in anticipation of probable weed growth or infestations.
  - 3. No herbicides or pesticides shall be applied until Weed and Pest Control Plan is approved and all applications shall be in accordance with the plan.
  - 4. If unanticipated weed growth or infestations occur, the Contractor shall be required to modify Weed and Pest Control Plan and secure written approval of Owner and Owner's Representative prior to application.
  - 5. The Owner and Owner's Representative shall review and approve the plan.
- B. All applications of herbicides and pesticides shall be performed by Oregon State licensed commercial applicator. All precautions shall be taken in the handling and applications of all herbicides and pesticides as stated on the product label and in the Pacific Northwest Weed Control Handbook, latest edition. No contamination of vicinity water systems or storm drain systems allowed. No cleaning of equipment or disposal of products allowed in project vicinity.

### PART 2 - PRODUCTS

#### 2.1 GENERAL

- A. All products shall be as specified in the appropriate Specification Sections.

**PART 3 - EXECUTION****3.1 GENERAL**

- A. Inspection: All grounds will be inspected weekly throughout the maintenance period for weeds, pests, plant health, erosion, paper and debris.
- B. Pest and Disease Control:
  - 1. Inspect all plants for signs of pest or disease once per week during the growing season and report any such conditions in the monthly report.
  - 2. Begin treatment for pests or diseases immediately following observation.
  - 3. Pest and disease control shall be carried out by skilled operators, using methods approved under current laws and regulations.
  - 4. Use the recommended type of equipment and method of application for each chemical as recommended by the chemical manufacturer.
  - 5. All chemicals shall be mixed and applied as stated on the label of the manufacturer.
  - 6. Be extremely cautious in the mixing, handling and application of all chemicals as they may be harmful (if misused) to humans, plants, and animals.
  - 7. The Contractor shall be liable for any damage caused through the misuse of any plant disease or plant insect control method.
  - 8. Rodent Control: The Contractor shall take the necessary action to prevent damage by rodents and moles. Such damage that does occur shall be repaired by the Contractor.
- C. Watering:
  - 1. An irrigation system will be installed on this Project. The Contractor shall ensure that the irrigation system is in an operating condition throughout the period of this Contract.
  - 2. Coordinate and manage the irrigation controller so that appropriate amounts of water are applied based on season, weather condition and plant material.

**3.2 LAWN AREA OPERATIONS****A. Fine Mowing:**

- 1. For all Lawn areas the Contractor shall inspect and police the grounds for litter and debris prior to each mowing, and dispose of it.
- 2. All Lawn is to be mowed every 7 days beginning in April and through the end of September, with an additional two mowings in October, November, December, February and March as needed.
- 3. Mowing height for all irrigated lawn areas shall be no less than 1-1/2inches, not to exceed 2-1/2 inches between mowing operations.
- 4. Mowing height for non-irrigated lawn areas shall be not less than 3 inches, not to exceed 6 inches between mowing operations.
- 5. The lawn shall be cut at a uniform height, with reel mowers in open areas and rotaries in closed areas. Scalping and uneven cutting shall be prevented. Any

- excess clippings shall be dispersed and/or collected to prevent damage to existing lawn areas or if it causes an unsightly appearance.
6. Mower blades shall be maintained in a good condition for an even cut. Mower blades shall be cleaned prior to entering site to prevent dispersal of weed seeds picked up from off site.
  7. Contractor shall repair or replace all trees, shrubs and other plantings and other permanent fixtures that are damaged during mowing operations. Mowing equipment will be adjusted and maintained to provide the best possible cut.
- B. Edging: All sidewalks, curb lines, concrete slabs, bed edges shall be edged as needed to maintain a neat, clean appearance, once every three mowings (minimum).
- C. Hand Trimming: Trimming shall be performed around all road signs, guard posts, trees, shrubs, utility poles and other obstacles. The grass to be trimmed shall be trimmed no less than the desired height of cut determined by the mowing operation. Trimming is to be done with each mowing operation.
- D. Lawn Fertilization:
1. Fertilizing and Liming: Perform as recommended in the soil analysis reports submitted under Division 32 Section "Soil Preparation," and as necessary to maintain cover crop in a healthy growing condition.
  2. Application of fertilizers carried out by the Contractor to maintain proper nutrient levels and provide a consistent dark green lush appearance throughout the maintenance period. Lawn shall be fertilized a minimum of 1 time per maintenance period applying 8 pounds of nitrogen per 1,000 square feet, to maintain a consistent, lush green appearance.
  3. Deficiencies of sulfur or magnesium or other nutrients as determined by soil analysis shall be corrected as needed. Timing of these applications may vary according to the need for response.
- E. Weed Control:
1. Inspect Lawn areas for weed growth twice per month during the growing season and remove all weeds within one week of observing weed growth.
  2. Maintain all areas in a weed free condition.
  3. The application of herbicides on all mowed lawn areas shall be done according to the approved Pest and Weed Control Plan. One application with follow-up applications as required to maintain a kill of 90 percent of broadleaf weeds shall be required.
  4. Pre-emergent herbicides to be used to control specific annual grasses, such as annual bluegrass and crab grass.
  5. Weed control procedures shall have no detrimental effect on the growth of desired plants.
- F. Re-Seeding: Upon detection of damaged or failing areas and areas showing unsatisfactory growth and coverage, the restore the area as necessary to establish a complete cover crop. Reseed using the seed mixes specified.
- G. Clean Walks: At the conclusion of each visit, walks adjacent to work areas are to be cleaned.

H. Leaf Removal:

1. Removal of all leaves from all lawns, planter beds and walkways and their disposal offsite shall be completed throughout the maintenance period as needed to maintain a clean appearance throughout the Project.
  2. Main entries, high traffic areas, and walkways shall be cleaned weekly. All other landscape areas are to have complete leaf removal monthly, during October, November and December.
- I. Aeration of Lawn Areas: Aeration is an extra service, to be performed as needed with Owner's authorization.

3.3 ORNAMENTAL PLANTING AREAS

A. Fertilizing:

1. Fertilizing and Liming: Perform as recommended in the Soil Analysis reports and recommendations, and as necessary to maintain cover crop in a healthy growing condition. See Division 32 Section "Soil Preparation."
2. Fertilizing of all trees, shrubs and ground cover is to be done once at the end of the maintenance period. Work the fertilizer thoroughly into the top 2 inches of soil.
3. In March, within the first growing season, fertilize all planting areas with one (1) application of each of the following fertilizers, all at the rate of 7 pounds per 1000 square feet of soil surface:
  - a. Nitroform slow release (38-0-0)
  - b. Treble superphosphate (0-45-0)
  - c. Sulphate of potash (0-0-50)

B. Weed Control:

1. All planter beds, tree circles, sidewalk cracks, and pavers, are to be sprayed once per month to control unwanted grasses and broadleaf weeds according to approved Pest Control Plan. Chemical practices shall not be a substitute for hand-weeding where the latter is required for complete removal.
2. All planter beds are to have one application of pre-emergence herbicide at the end of the maintenance period. Pre-emergence herbicides shall be of the non-leaching type, with minimal soil contaminating levels. Pre-emergence herbicides shall not be used in groundcover areas unless approved by the Owner's Representative.

- C. Pruning: done to enhance natural growth. The Contractor shall remove dead, damaged and diseased portions of the plant. Do not remove collar at the branch base when pruning. All major pruning shall be done following flowering or during plant's dormant season. Emergency or minor pruning shall be done when needed. Pruning of trees shall be performed by a certified arborist.
1. Shearing of plantings will be permitted only where directed by the Owner's Representative.
  2. Provide remedial attention and repair to shrubs and trees as appropriate by season or in response to incidental damage.

3. Prune shrubbery to maintain proper size in relationship to adjacent planting and intended function.
  4. Prune trees as required to remove weak branching patterns and maintain balance of head growth development. Remove lower limbs when obstructing vehicular or pedestrian clearances.
  5. Prune groundcover plantings as required to restrain perimeter growth to within planting areas where adjacent to walks and curbs. Tip prune selected branchlets of low growing shrub or groundcover masses to maintain even overall heights and promote fullness.
  6. Spent blooms shall be removed from all flowering shrubs to promote better growth habit and flower production.
  7. Remove blades of ornamental grasses that lay over flat to the ground. Retain grasses that are able to support their own weight. In the early spring, tie-off ornamental grasses with jute twine or a grass blade at the base of the plant and cut evenly across 6 inches from the base of the plant.
- D. Raking: All planter beds will be raked through once per month to remove debris and promote an attractive fresh appearance.
- E. Mulching: Maintain a 2-inch depth of specified mulch over all shrub planting areas unless directed otherwise by the Owner's Representative. Do not mulch groundcover areas.
- F. Tree Stakes:
1. Check ties every 4 months to ensure that they are not causing a depression in the bark. Loosen, repair or replace as required.
  2. Retain guy wires in good repair until the tree is strong enough to withstand strong winds. Check at end of maintenance period. Ensure that they do not cause a depression in the bark. Repair or replace as required.
- G. Cultivating:
1. In the spring, before beginning watering, cultivate the soil surface shallowly as necessary to ensure penetration of water and air into the soil. Repeat as necessary for weed control and soil permeability.
  2. Avoid cultivating into the root zone of plants, particularly shallow-rooted groundcovers and rhododendrons.

#### 3.4 IRRIGATION EQUIPMENT WARRANTY WORK AND OPERATION

- A. Establish time settings and intervals of irrigation water application for each valve of all irrigation zones. Make changes when necessary to correspond to variable watering requirements for all planting areas.
- B. Observe operation of all irrigation heads at least twice each operating month. Check for coverage and plugged or broken heads and leaks; repair leaks, balance system and clean or replace heads or nozzles as required to maintain system in proper working order. Replacement heads shall be as originally specified in the Drawings and Specifications.

- C. Perform necessary site visits and observations to maintain the proper amounts of moisture in soils to promote healthy and vigorous plant growth. Correct conditions of over or under-watering as may be determined by weekly observations during the irrigation season.
- D. System Winterization: Shut off and completely drain systems no later than November 1. Turn off all main supply valves; open all manual drain valves; air drain, and bleed valves on backflow prevention devices. Perform winterization prior to the specified dates in the event of earlier freezing weather.
- E. System Spring Start-up: Activate irrigation systems in late March. Contractor shall be responsible for repairing damage caused by freezing at no additional cost to Owner. Operate and observe all portions of the system and perform necessary rebalancing, flushing, cleaning or other work required to re-establish proper irrigation functions.
  - 1. Test and certify backflow preventers prior to placing the irrigation system back in service.
    - a. Original copies of the certification shall be submitted to the Owner.
    - b. Backflow preventers shall be labeled with plastic laminated field history tag showing date and tester information.
  - 2. Flush drip valve filters and backflow preventer "Y"-strainers.
- F. Repair and/or replacement for any work damaged or otherwise affected even by causes beyond Contractor's control shall be the responsibility of the Contractor.
- G. Repair trench backfill which settles more than 1 inch during the Irrigation Warranty period. Warranty to include repair of planting areas, lawns, paving and walks damaged by settlement.

END OF SECTION 32 9500

**SECTION 33 11 00 – WATER DISTRIBUTION****PART 1 -GENERAL****1.1 SUMMARY**

- A. This Section includes water-distribution piping and related components outside the building for fire-service mains.

**1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Detail precast concrete vault assemblies and indicate dimensions, method of field assembly, and components.
- C. Field quality-control test reports.
- D. Operation and maintenance data.

**1.3 QUALITY ASSURANCE**

- A. Regulatory Requirements:
  1. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
  2. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.
- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- C. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.

**1.4 PROJECT CONDITIONS**

- A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others.

**1.5 COORDINATION**

- A. Coordinate connection to water main with utility company.

**PART 2 -PRODUCTS****2.1 PIPE AND FITTINGS**

- A. Soft Copper Tube: ASTM B 88, Type K, water tube, annealed temper.
  - 1. Copper, Solder-Joint Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.
- B. Hard Copper Tube: ASTM B 88, Type K, water tube, drawn temper.
  - 1. Copper, Solder-Joint Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought-copper, solder-joint pressure type. Furnish only wrought-copper fittings if indicated.
- C. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
  - 1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
  - 2. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
- D. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.
  - 1. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
  - 2. Gaskets: AWWA C111, rubber.
- E. Grooved-Joint, Ductile-Iron Pipe: AWWA C151, with cut, rounded-grooved ends.
  - 1. Grooved-End, Ductile-Iron Pipe Appurtenances:
    - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - b. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - i. Anvil International, Inc.
      - ii. Victaulic Company of America.
- F. PVC, Schedule 80 Pipe: ASTM D 1785.
  - 1. PVC, Schedule 80 Socket Fittings: ASTM D 2467.
  - 2. PVC, Schedule 80 Threaded Fittings: ASTM D 2464.

- G. PVC, AWWA Pipe: AWWA C900, Class 150, with bell end with gasket, and with spigot end.
1. Comply with UL 1285 for fire-service mains if indicated.
  2. PVC Fabricated Fittings: AWWA C900, Class 150, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
  3. PVC Molded Fittings: AWWA C907, Class 150, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
  4. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
    - a. Gaskets: AWWA C111, rubber.
  5. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
    - a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.

## 2.2 JOINING MATERIALS

- A. Brazing Filler Metals: AWS A5.8, BCuP Series.
- B. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

## 2.3 PIPING SPECIALTIES

- A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- B. Tubular-Sleeve Pipe Couplings:
  1. Description: Metal, bolted, sleeve-type, reducing or transition coupling, with center sleeve, gaskets, end rings, and bolt fasteners and with ends of same sizes as piping to be joined.
    - a. Standard: AWWA C219.

## 2.4 GATE VALVES

### A. UL/FMG, Cast-Iron Gate Valves:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. American Cast Iron Pipe Co.; American Flow Control Div.
  - b. American Cast Iron Pipe Co.; Waterous Co. Subsidiary.
  - c. Crane Co.; Crane Valve Group; Stockham Div.
  - d. McWane, Inc.; Clow Valve Co. Div. Oskaloosa.
  - e. McWane, Inc.; Kennedy Valve Div.
  - f. McWane, Inc.; M & H Valve Company Div.
  - g. Mueller Co.; Water Products Div.
  - h. NIBCO INC.
  - i. U.S. Pipe and Foundry Company.

2. UL/FMG, Nonrising-Stem Gate Valves:

- a. Description: Iron body and bonnet with flange for indicator post, bronze seating material, and inside screw.
  - i. Standards: UL 262 and FMG approved.
  - ii. Minimum Pressure Rating: 175 psig .
  - iii. End Connections: Flanged.

## 2.5 GATE VALVE ACCESSORIES AND SPECIALTIES

- A. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over valve and with a barrel approximately 5 inches in diameter.
  1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

**2.6 EXECUTION****2.7 EARTHWORK**

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

**2.8 PIPING APPLICATIONS**

- A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.
- B. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used, unless otherwise indicated.
- C. Do not use flanges or unions for underground piping.
- D. Flanges, unions, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
- E. Underground water-service piping NPS 3/4 to NPS 3 shall be any of the following:
1. Soft copper tube, ASTM B 88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
  2. PVC, Schedule 80 pipe; PVC, Schedule 80 socket fittings; and solvent-cemented joints.
- F. Vault Water-Service Piping NPS 3/4 to NPS 3 shall be hard copper tube, ASTM B 88, Type K; wrought-copper, solder-joint fittings; and brazed joints.
- G. Underground Fire-Service-Main Piping NPS 4 to NPS 8 shall be any of the following:
1. Ductile-iron, push-on-joint pipe; ductile-iron, push-on-joint fittings; and gasketed joints.
  2. PVC, AWWA Class 150 pipe listed for fire-protection service; PVC fabricated or molded fittings of same class as pipe; and gasketed joints.
- H. Vault Fire-Service-Main Piping NPS 4 to NPS 8 shall be ductile-iron, grooved-end pipe; ductile-iron-pipe appurtenances; and grooved joints.

## 2.9 VALVE APPLICATIONS

- A. General Application: Use mechanical-joint-end valves for NPS 3 and larger underground installation. Use threaded- or flanged-end valves for installation in vaults. Use UL/FMG, nonrising-stem gate valves for installation with indicator posts. Use corporation valves and curb valves with ends compatible with piping, for NPS 2 and smaller installation.
- B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Underground Valves, NPS 3 and Larger: AWWA, cast-iron, nonrising-stem, resilient-seated gate valves with valve box.
  - 2. Use the following for valves in vaults and aboveground:
    - a. Gate Valves, NPS 2 and Smaller: Bronze, nonrising stem.
    - b. Gate Valves, NPS 3 and Larger: AWWA, cast iron, OS&Y rising stem, metal seated.

## 2.10 PIPING INSTALLATION

- A. Comply with NFPA 24 for fire-service-main piping materials and installation.
  - 1. Install copper tube and fittings according to CDA's "Copper Tube Handbook."
- B. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.
- C. Install PVC, AWWA pipe according to ASTM F 645 and AWWA M23.
- D. Bury piping with depth of cover over top at least 30 inches, with top at least below level of maximum frost penetration.
- E. Extend water-service piping and connect to water-supply source and building-water-piping systems at outside face of building wall in locations and pipe sizes indicated.
  - 1. Terminate water-service piping at building wall until building-water-piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building-water-piping systems when those systems are installed.
- F. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

## 2.11 JOINT CONSTRUCTION

- A. Make pipe joints according to the following:
1. Ductile-Iron Piping, Gasketed Joints for Water-Service Piping: AWWA C600 and AWWA M41.
  2. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.
  3. Ductile-Iron Piping, Grooved Joints: Cut-groove pipe. Assemble joints with grooved-end, ductile-iron-piping couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions.
  4. PE Piping Insert-Fitting Joints: Use plastic insert fittings and fasteners according to fitting manufacturer's written instructions.
  5. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.
  6. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure. Refer to Division 2 Section "Piped Utilities - Basic Materials and Methods" for joining piping of dissimilar metals.

## 2.12 ANCHORAGE INSTALLATION

- A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:
1. Concrete thrust blocks.
  2. Locking mechanical joints.
  3. Set-screw mechanical retainer glands.
  4. Bolted flanged joints.
  5. Heat-fused joints.
  6. Pipe clamps and tie rods.
- B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.
  2. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.
  3. Fire-Service-Main Piping: According to NFPA 24.
- C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

## 2.13 VALVE INSTALLATION

- A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.
- B. UL/FMG, Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.
- C. MSS Valves: Install as component of connected piping system.
- D. Corporation Valves and Curb Valves: Install each underground curb valve with head pointed up and with service box.

## 2.14 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after concrete thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than one-and-one-half times working pressure for two hours.
  1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig. Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.
- C. Prepare reports of testing activities.

## 2.15 IDENTIFICATION

- A. Install continuous underground[ detectable] warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Division 2 Section "Earthwork."

## 2.16 CLEANING

- A. Clean and disinfect water-distribution piping as follows:
  1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
  2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.

3. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or do as follows:
  - a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
  - b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
  - c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
  - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.
- B. Prepare reports of purging and disinfecting activities.

END OF SECTION 33 11 00

**SECTION 33 41 00 - STORM UTILITY DRAINAGE PIPING****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. Section Includes:

1. Pipe and fittings.
2. Nonpressure transition couplings.
3. Backwater valves.
4. Cleanouts.
5. Area drains.
6. Dry wells.
7. Water quality manhole.
8. Water quality catch basin.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.
- C. Field quality-control reports.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Do not store plastic manholes, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes according to manufacturer's written rigging instructions.
- D. Handle catch basins and stormwater inlets according to manufacturer's written rigging instructions.

**PART 2 - PRODUCTS****2.1 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS**

- A. Pipe and Fittings: ASTM A 74, Service class.
- B. Gaskets: ASTM C 564, rubber.
- C. Calking Materials: ASTM B 29, pure lead and oakum or hemp fiber.

**2.2 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS**

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. CISPI-Trademarked, Shielded Couplings:
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. ANACO-Husky.
    - b. Dallas Specialty & Mfg. Co.
    - c. Fernco Inc.
    - d. Mission Rubber Company; a division of MCP Industries, Inc.
    - e. Stant; a Tompkins company.
    - f. Tyler Pipe.
  - 2. Description: ASTM C 1277 and CISPI 310, with stainless-steel corrugated shield; stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

**2.3 PE PIPE AND FITTINGS**

- A. Corrugated PE Drainage Pipe and Fittings NPS 3 to NPS 10: AASHTO M 252M, Type S, with smooth waterway for coupling joints.
  - 1. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings.
  - 2. Soiltight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.
- B. Corrugated PE Pipe and Fittings NPS 12 to NPS 60: AASHTO M 294M, Type S, with smooth waterway for coupling joints.
  - 1. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings.
  - 2. Soiltight Couplings: AASHTO M 294M, corrugated, matching pipe and fittings.

**2.4 PVC PIPE AND FITTINGS****A. PVC Type PSM Sewer Piping:**

1. Pipe: ASTM D 3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
2. Fittings: ASTM D 3034, PVC with bell ends.
3. Gaskets: ASTM F 477, elastomeric seals.

**2.5 NONPRESSURE TRANSITION COUPLINGS**

**A.** Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.

**B. Sleeve Materials:**

1. For Cast-Iron Soil Pipes: ASTM C 564, rubber.
2. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
3. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

**C. Shielded, Flexible Couplings:**

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Cascade Waterworks Mfg.
  - b. Dallas Specialty & Mfg. Co.
  - c. Mission Rubber Company; a division of MCP Industries, Inc.
2. Description: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

**D. Ring-Type, Flexible Couplings:**

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Fernco Inc.
  - b. Logan Clay Pipe.
  - c. Mission Rubber Company; a division of MCP Industries, Inc.
2. Description: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

**2.6 BACKWATER VALVES****A. Plastic Backwater Valves:**

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Canplas LLC.
  - b. IPS Corporation.
  - c. NDS Inc.
  - d. Plastic Oddities; a division of Diverse Corporate Technologies, Inc.
  - e. Sioux Chief Manufacturing Company, Inc.
  - f. Zurn Light Commercial Products Operation; Zurn Plumbing Products Group.
2. Description: Horizontal type; with PVC body, PVC removable cover, and PVC swing check valve.

**2.7 CLEANOUTS****A. Cast-Iron Cleanouts:**

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Josam Company.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
2. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside cork or spigot connection and countersunk, tapered-thread, brass closure plug.
3. Top-Loading Classification(s): Heavy Duty.
4. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

## 2.8 MANHOLES

### A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
8. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
9. Steps: ASTM A 615/A 615M, deformed, 1/2-inch steel reinforcing rods encased in ASTM D 4101, PP, wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12- to 16-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches.
10. Adjusting Rings: Interlocking HDPE rings with level or sloped edge in thickness and diameter matching manhole frame and cover, and of height required to adjust manhole frame and cover to indicated elevation and slope. Include sealant recommended by ring manufacturer.
11. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.

### B. Manhole Frames and Covers:

1. Description: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch- minimum width flange and 26-inch- diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "STORM SEWER."
2. Material: ASTM A 536, Grade 60-40-18 ductile iron unless otherwise indicated.

## 2.9 CONCRETE

### A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio.
  - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
  - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.
- C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
  - 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: 2 percent through manhole.
  - 2. Benches: Concrete, sloped to drain into channel.
    - a. Slope: 4 percent.
- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.
  - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
  - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

## 2.10 AREA DRAINS

- A. Area Drains:
  - 1. Description: welded 10 gauge steel, trapped, coated inside and outside with asphaltic paint. Meeting Oregon State Plumbing Specialty Code.
  - 2. Shop welded no-hub outlet with integral cleanout option.
  - 3. Grate: Ductile Iron, 15-inches square.
  - 4. Acceptable Manufacturers:
    - a. The Lynch Company.
    - b. Gratemaster, Inc.
    - c. Gibson Steel Co.

**2.11 DRY WELLS**

- A. Description: ASTM C 913, precast, reinforced, perforated concrete rings. Include the following:
1. Floor: precast with concrete base unit.
  2. Cover: Liftoff-type concrete cover with cast-in lift rings.
  3. Wall Thickness: 4 inches minimum with 1-inch diameter or 1-by-3-inch- maximum slotted perforations arranged in rows parallel to axis of ring.
    - a. Total Free Area of Perforations: Approximately 15 percent of ring interior surface.
    - b. Ring Construction: Designed to be self-aligning.
  4. Filtering Material: ASTM D 448, Size No. 24, 3/4- to 2-1/2-inch washed, crushed stone or gravel.

**2.12 WATER QUALITY MANHOLE**

- A. Description: Contech Stormwater Solutions ([www.conteches.com](http://www.conteches.com))
1. Model: CDS2015-4
  2. Site specific requirements: See Drawings.

**2.13 WATER QUALITY CATCH BASIN**

- A. Description: Contech Stormwater Solutions ([www.conteches.com](http://www.conteches.com))
1. Model: 1 Cartridge Catchbasin "Stormfilter".
    - a. Metal basin body.
    - b. Concrete collar around top rim.
    - c. Media Type: CSF.
  2. Site specific requirements: See Drawings.

**PART 3 - EXECUTION****3.1 EARTHWORK**

- A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

### 3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- F. Install gravity-flow, nonpressure drainage piping according to the following:
  1. Install piping pitched down in direction of flow.
  2. Install piping with 36-inch minimum cover.
  3. Install hub-and-spigot, cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
  4. Install hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
  5. Install ductile-iron piping and special fittings according to AWWA C600 or AWWA M41.
  6. Install PE corrugated sewer piping according to ASTM D 2321.
  7. Install PVC profile gravity sewer piping according to ASTM D 2321 and ASTM F 1668.
  8. Install PVC water-service piping according to ASTM D 2321 and ASTM F 1668.

### 3.3 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure drainage piping according to the following:
  1. Join hub-and-spigot, cast-iron soil piping with gasketed joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
  2. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead and oakum calked joints.
  3. Join hubless cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-coupling joints.
  4. Join ductile-iron culvert piping according to AWWA C600 for push-on joints.
  5. Join ductile-iron piping and special fittings according to AWWA C600 or AWWA M41.
  6. Join corrugated PE piping according to ASTM D 3212 for push-on joints.

7. Join PVC profile gravity sewer piping according to ASTM D 2321 for elastomeric-seal joints or ASTM F 794 for gasketed joints.
8. Join dissimilar pipe materials with nonpressure-type flexible couplings.

### 3.4 BACKWATER VALVE INSTALLATION

- A. Install horizontal-type backwater valves in piping where indicated.
- B. Install combination horizontal and manual gate-valve type in piping and in manholes where indicated.
- C. Install terminal-type backwater valves on end of piping and in manholes where indicated.

### 3.5 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
  1. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.
- B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding earth grade.
- C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

### 3.6 MANHOLE INSTALLATION

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.
- D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere unless otherwise indicated.

### 3.7 AREA DRAIN INSTALLATION

- A. Construct area drains to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

**3.8 DRY WELL INSTALLATION**

- A. Excavate hole to diameter of at least 6 inches greater than outside of dry well. Do not extend excavation into ground-water table.
- B. Install precast, concrete-ring dry wells according to the following:
  1. Assemble rings to depth indicated.
  2. Extend rings to height where top of cover will be approximately 8 inches below finished grade.
  3. Backfill bottom of inside of rings with filtering material to level at least 12 inches above bottom.
  4. Extend effluent inlet pipe 12 inches into rings and terminate into side of tee fitting.
  5. Backfill around outside of rings with filtering material to top level of rings.
  6. Install cover over top of rings.

**3.9 CONCRETE PLACEMENT**

- A. Place cast-in-place concrete according to ACI 318.

**3.10 WATER QUALITY MANHOLE**

- A. Install per manufacturer's written instructions.

**3.11 WATER QUALITY CATCH BASIN**

- A. Install per manufacturer's written instructions.

**3.12 CONNECTIONS**

- A. Connect nonpressure, gravity-flow drainage piping in building's storm building drains specified in Division 22 Section "Facility Storm Drainage Piping."
- B. Connect force-main piping to building's storm drainage force mains specified in Division 22 Section "Facility Storm Drainage Piping." Terminate piping where indicated.
- C. Make connections to existing piping and underground manholes.
  1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.

3. Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes and structures by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe, manhole, or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
    - a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
    - b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
  4. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.
- D. Connect to sediment interceptors specified in Division 22 Section "Sanitary Waste Interceptors."
- E. Pipe couplings, expansion joints, and deflection fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
1. Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.
    - a. Shielded flexible couplings for same or minor difference OD pipes.
    - b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
    - c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
  2. Use pressure-type pipe couplings for force-main joints.

### 3.13 IDENTIFICATION

- A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
1. Use detectable warning tape over nonferrous piping and over edges of underground structures.

### 3.14 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
  - 1. Submit separate reports for each system inspection.
  - 2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  - 4. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
  - 1. Do not enclose, cover, or put into service before inspection and approval.
  - 2. Test completed piping systems according to requirements of authorities having jurisdiction.
  - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  - 4. Submit separate report for each test.
  - 5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
    - a. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.
- C. Leaks and loss in test pressure constitute defects that must be repaired.
- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

### 3.15 CLEANING

- A. Clean interior of piping of dirt and superfluous materials. Flush with water. Capture all small sediment and debris at end of line, prior to discharge into drywell.

END OF SECTION 33 41 00

**SECTION 33 46 00 - SUBDRAINAGE****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Perforated-wall pipe and fittings.
2. Geotextile filter fabrics.

**1.2 ACTION SUBMITTALS****A. Product Data: For geotextile filter fabrics.****PART 2 - PRODUCTS****2.1 PERFORATED-WALL PIPES AND FITTINGS****A. Perforated PE Pipe and Fittings: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.****2.2 SOIL MATERIALS****A. Soil materials are specified in Section 312000 "Earth Moving."****2.3 GEOTEXTILE FILTER FABRICS****A. Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from 110 to 330 gpm/sq. ft. when tested according to ASTM D 4491.****B. Structure Type: Nonwoven, needle-punched continuous filament.**

1. Survivability: AASHTO M 288 Class 2.
2. Styles: Flat and sock.

**PART 3 - EXECUTION****3.1 EARTHWORK****A. Excavating, trenching, and backfilling are specified in Section 312000 "Earth Moving."**

### 3.2 FOUNDATION DRAINAGE INSTALLATION

- A. Place impervious fill material on subgrade adjacent to bottom of footing after concrete footing forms have been removed. Place and compact impervious fill to dimensions indicated, but not less than 6 inches deep and 12 inches wide.
- B. Lay flat-style geotextile filter fabric in trench and overlap trench sides.
- C. Place supporting layer of drainage course over compacted subgrade and geotextile filter fabric, to compacted depth of not less than 4 inches.
- D. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with adhesive tape.
- E. Install drainage piping as indicated in Part 3 "Piping Installation" Article for foundation subdrainage.
- F. Add drainage course to width of at least 6 inches on side away from wall and to top of pipe to perform tests.
- G. After satisfactory testing, cover drainage piping to width of at least 6 inches on side away from footing and above top of pipe to within 12 inches of finish grade.
- H. Install drainage course and wrap top of drainage course with flat-style geotextile filter fabric.
- I. Place layer of flat-style geotextile filter fabric over top of drainage course, overlapping edges at least 4 inches.
- J. Place backfill material over compacted drainage course. Place material in loose-depth layers not exceeding 6 inches. Thoroughly compact each layer. Final backfill to finish elevations and slope away from building.

### 3.3 PIPING INSTALLATION

- A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.
  1. Foundation Subdrainage: Install piping level and with a minimum cover of 36 inches unless otherwise indicated.
  2. Underslab Subdrainage: Install piping level.
  3. Retaining-Wall Subdrainage: When water discharges at end of wall into stormwater piping system, install piping level and with a minimum cover of 36 inches unless otherwise indicated.
  4. Lay perforated pipe with perforations down.
  5. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.
- B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.
- C. Install thermoplastic piping according to ASTM D 2321.

**3.4 PIPE JOINT CONSTRUCTION**

- A. Join perforated PE pipe and fittings with couplings according to ASTM D 3212 with loose banded, coupled, or push-on joints.
- B. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and fit materials and dimensions of both pipes.

**3.5 BACKWATER VALVE INSTALLATION**

- A. Comply with requirements for backwater valves specified in Section 334100 "Storm Utility Drainage Piping."
- B. Install horizontal backwater valves in header piping downstream from perforated subdrainage piping.
- C. Install horizontal backwater valves in piping in accessible vaults where indicated.

**3.6 CLEANOUT INSTALLATION**

- A. Comply with requirements for cleanouts specified in Section 334100 "Storm Utility Drainage Piping."
- B. Cleanouts for Foundation and Retaining-Wall Subdrainage:
  1. Install cleanouts from piping to grade. Locate cleanouts at beginning of piping run and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.
  2. In vehicular-traffic areas, use NPS 4 cast-iron soil pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 18 by 18 by 12 inches deep. Set top of cleanout flush with grade.
  3. In nonvehicular-traffic areas, use NPS 4 PVC pipe and fittings for piping branch fittings and riser extensions to cleanout. Set cleanout frames and covers in a cast-in-place concrete anchor, 12 by 12 by 4 inches deep. Set top of cleanout 1 inch above grade.

**3.7 CONNECTIONS**

- A. Comply with requirements for piping specified in Section 334100 "Storm Utility Drainage Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect low elevations of subdrainage system to building's solid-wall-piping storm drainage system.

**3.8 FIELD QUALITY CONTROL**

- A. Tests and Inspections:
  1. After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling.
  2. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.
- B. Drain piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.9 CLEANING

- A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 33 46 00