

An Exterior Renovation Project for the

**Fern Ridge School District:
District Administrative Offices**

88834 TERRITORIAL HWY
ELMIRA, OREGON

BY

PAUL L. BENTLEY, ARCHITECT, A.I.A.

E-Mail: paul@paulbentleyarchitect.com



PAUL L BENTLEY
Architect A.I.A. P.C.

615 SE JACKSON STREET
ROSEBURG, OR 97470

PHONE: 541-672-0273
FAX: 541-673-7560

JULY 2016

A Re-Roof Project for the

**Fern Ridge School District:
Elmira High School**

88834 TERRITORIAL HWY
ELMIRA, OREGON

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JULY 2016

FERN RIDGE DISTRICT OFFICE RENOVATION 2016

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NOTE: This index is for convenience only. Its accuracy and completeness are not guaranteed, and it is not to be considered a part of the Specifications. In case of discrepancy between the Index and the Specifications, the Specifications shall govern.

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FERN RIDGE SCHOOL DISTRICT 28J

88834 Territorial Rd
Elmira, OR 97437

INVITATION TO BID

Renovations of Fern Ridge District Office

Bids Due: Thursday, July 28, 2016

Time Due: 2:00 pm, PST

Business Manager:

Quanah Bennett

Phone: (541) 935-2253

Email: qbennett@fernridge.k12.or.us

INVITATION TO BID

The FERN RIDGE SCHOOL DISTRICT 28J (District) invites qualified Respondents to submit bids to construct the renovations of the District Office. Bids are due by 2:00 pm, PST, on Thursday, July 28, 2016. The District reserves the right to reject any or all bids; this invitation to bid does not obligate the District to accept or contract for any expressed or implied services. The successful bidder must comply with the District's equal opportunity requirements.

SCOPE OF WORK

The scope of the project is to consists of a complete removal of existing siding and trim down to existing sheathing on all exterior walls, demolition and replacement of all windows and coverings, shingle roofing removal and replacement, new gutters and downspouts, new concrete ramps and steps, HVAC upgrades (Alternate bid), and various other repairs and renovations to the District Offices, 88834 Territorial Road, Elmira, Oregon, as shown on Contract Documents prepared by Paul L. Bentley Architect, A.I.A., dated June 2016 and July 2016.

The successful bidder will perform all work described in the construction documents for the project.

WALKTHROUGH

There will be a mandatory, pre-bid walkthrough to give prospective bidders a better understanding of the project. The mandatory walkthrough will be at 2:00 pm on Tuesday July 12th, 2016, at the District Office at 88834 Territorial Road, Elmira, OR, 97437. The meeting will begin in the conference room at the District Office followed by a walkthrough of the building. All bidders must attend the meeting to qualify to submit bids on the project.

SUBMISSION REQUIREMENTS

To qualify as a responsive submission, the submittal must be fully completed. An authorized representative must sign the Statement of Assurances in ink. Submittals can be mailed or hand delivered to Fern Ridge School District 28J, 88834 Territorial Rd, Elmira, OR 97437. Responses must be received by 2 pm on July 28, 2016.

BID OPENING

Bids will be accepted until 2:00 pm PST on Thursday, July 28, 2016. Bids must be received on or before that time; postmarks or other proof of dispatch ARE NOT acceptable as delivery by the time set. Bids will be opened at the district office after the bid time closes. Pursuant to ORS 279C.370, for contracts with an estimated value of more than \$100,000, contractors will have until 4:00pm PST on July 28, 2016 to submit disclosure of the first tier subcontractors, if any.

BID FORM

Each bidder must identify whether the bidder is or is not a resident bidder, as defined in ORS 279A.120. No bidder or subcontractor can be considered if the bidder or a subcontractor is on the current list of contractors ineligible to receive public works contracts as published by the Commissioner of the Bureau of Labor and Industries (BOLI).

No offer will be considered by the District unless the offeror has acknowledged that Contractor agrees to be bound by and will comply with the provisions of ORS 279C.838, 279C. The District shall pay the required prevailing wage fee to BOLI.

No offer will be considered by the District unless the offeror is registered with the Oregon Construction Contract Board. The Contractor need not be licensed for asbestos abatement. Every Contractor and subcontractor must have a public works bond filed with the Commissioner of the Bureau of Labor and Industries before starting work, unless exempt.

Each bidder must certify that there has been no discrimination against minority, women or emerging small business enterprises in obtaining any subcontracts. Bidders are encouraged to include minority, women or emerging small business enterprises as subcontractors.

Instructions for First-Tier Subcontractor Disclosure: Bidders are required to disclose information about certain first-tier subcontractors when the contract value for a public Improvement is greater than \$100,000. Specifically, when the contract amount of a first-tier subcontractor furnishing labor or labor and materials would be greater than or equal to:

- i. Five percent of the project Bid, but at least \$15,000; or
- ii. \$350,000 regardless of the percentage.

The Bidder must disclose the following information about that subcontract either in its Bid submission, or within two hours after Bid Closing:

- A. Subcontractor's name;
- B. Category of work that the subcontractor would be performing, and
- C. Dollar value of the subcontract.

If the Bidder will not be using any subcontractors that are subject to the above disclosure requirements, the Bidder is required to indicate "NONE" on the accompanying form.

THE DISTRICT MUST REJECT A BID IF THE BIDDER FAILS TO SUBMIT THE DISCLOSURE FORM WITH THIS INFORMATION BY THE STATED DEADLINE (OAR 137-049-0360)

SPECIFICATIONS AND ADDENDA

Any addenda will be posted at the same location as the bid document, labeled as “ADDENDUM” and numbered in order of issuance. Requests for notification can be made by sending an email to the Business Manager.

SELECTION PROCESS

Anticipated selection process:

- Bids will be reviewed for completeness after opening. Incomplete bids will be set aside.
- Completeness determinations will be made within 24 hours of bid closure.
- Notice of intent to award will be issued within 24 hours of bid openings
- Any protest of this solicitation must be submitted within seven days of the issuance of the solicitation. Any protest of the intent to award must be filed within two business days of the issuance of the notice of intent.

Any protest must be filed in writing with the District. The protest must indicate the nature of the objection, and must be sufficiently detailed for a neutral observer to discern the specific matter being objected to. Protests will be reviewed by the District and, if not resolved, will be submitted to the District’s Board of Directors. The decision of the Board of Directors is final.

The District will select the lowest cost Responsible Bidder. To be considered a Responsible Bidder, a bidder must submit a bid that demonstrates Bidder’s qualifications to perform the work in terms of staff qualifications, past related experience, and references. Bidders who cannot demonstrate satisfactory performance of at least two similar projects in similar circumstances will not be considered qualified.

The selected Respondents and all others who submitted Bids will be notified of the District’s selection.

Additional Notes:

In evaluating the bids and selecting a Respondent, the District reserves the following rights:

- To reject any bid not in compliance with the bid document or applicable procedures and requirements, and may reject for good cause any or all bids when it is in the public interest to do so;
- To issue subsequent requests for bids, if desired;
- Not to award a contract and cancel the process;
- To waive any minor irregularities or informalities in any bid;
- To negotiate with any Respondent to further amend, modify, refine, or delineate its bid, and the contract price as it is affected by such negotiation of scope of work, and specific contract terms;
- This Invitation to Bid does not constitute an offer to contract.
- There is no expressed or implied obligation for the District to reimburse responding bidders for any expenses incurred in preparing, submitting, or presenting Bids in response to this request.

END OF PAGE

**ATTACHMENT A
INVITATION TO BID RESPONSE**

Respondent Information

Bidder Name: _____

Office Address: _____

Office Phone Number: _____

Contact Name/Title: _____

Contact Email: _____

Contact Phone and Email: _____

Construction Contractor's Board License #: _____

1. Please include a signed Statement of Assurances (Attachment B).
2. Please include a pricing proposal, in the form of completion of a signed Attachment C.
3. Please include a completed subcontractor disclosure form, Attachment D. You must enter "NONE" if there are no subcontractors that need to be disclosed.

Summary:

Please complete and submit information requested in Attachment A, B, C and D.

**ATTACHMENT B
STATEMENT OF ASSURANCES**

1. The undersigned attests that he/she has the authority and/or responsibility to represent the organization submitting this Bid in all phases of the Invitation to Bid process and in this Statement of Assurances. The undersigned understands that any false or substantially incorrect statement in the Invitation to Bid may disqualify this Bid from further consideration or be cause for termination of any future Contract.
2. Respondent understands that this Invitation to bid is considered an integral part of the Request for Bid, and terms shall be binding on the Respondents. Failure of the successful bidder to accept these obligations in a Contract as authorized by the Statement of Assurances may result in cancellation of an award.
3. Respondent understands that in responding to this Invitation to Bid, Respondent certifies that the organization he/she represents is in compliance with all Oregon Tax laws described in ORS 305.380(4) and agrees to comply with all applicable federal, state, and local laws, regulations and requirements related to the Invitation to Bid and performance of any resulting Contract, including but not limited to those referenced in this Invitation.
4. Respondent certifies that Respondent can meet the insurance requirements check marked in Appendix D of the proposed Contract (Insurance Coverage Required) and that Respondent understands that such coverage must be kept active during the entire term of the Contract, if selected. The Respondent is a (check one) ___ resident Respondent or ___ nonresident Respondent of the State of Oregon as defined in ORS 279A.120.
5. Respondent, if selected as Contractor, agrees to be bound by and will comply with the provisions of ORS 279C.838 and 279C.840.
6. The Representative's Signature below is certification that there has been no discrimination against minority, women or emerging small business enterprises in obtaining any subcontracts.

I, the undersigned, have read and thoroughly understand the Invitation to Bid instructions and all other conditions of Invitation to Bid issued by the FERN RIDGE SCHOOL DISTRICT 28J and agree to abide by and fulfill the requirements thereof if awarded the Contract as a result of this Invitation to Bid.

Respondent Name: _____

Authorized Representative's Signature: _____

Type or Print Name & Title: _____

Date: _____

**ATTACHMENT C
PRICING PROPOSAL**

1. The undersigned (check one of the following and insert information requested),

NAME of FIRM: _____

____ A corporation organized and existing under the laws of the State of _____; or

____ A partnership registered under the laws of the State of _____; or

____ An individual proprietorship doing business under an assumed business name registered under the laws of the State of _____.

after having carefully examined the bidding documents and **addenda numbered _____ through _____** inclusive, as well as the work site and conditions affecting the work, hereby proposes and agrees to furnish all labor, materials, and all other work, required by and in strict conformance with the above documents, necessary to complete the project for the stipulated sum of:

Base Bid:

A. District Office Remodel

TOTAL (Figures):
\$ _____ Dollars

TOTAL (Words):
\$ _____ Dollars

Alternates:

Alternate #1 HVAC Upgrades:

TOTAL ADD (Figures)
\$ _____ Dollars

Alternate #2 Window Coverings:

TOTAL ADD (Figures)
\$ _____ Dollars

Alternate #3 Civil Work:

TOTAL ADD (Figures)
\$ _____ Dollars

2. The undersigned agrees to maintain the proposal price for a period of 30 calendar days after bid opening.

3. The undersigned agrees, if awarded a contract, to complete all work as shown in the Contract Documents by the substantial completion date listed below.

4. The undersigned agrees that, prior to commencement of the Work, and within 7 calendar days of Notice of Intent to Award, to:
 - A. Enter into and execute a contract for the work in the form of Fern Ridge School District, "Construction Contract".
 - B. Deliver to the Owner duly executed AIA Document G705, "Certificate of Insurance," or ACORD form 25S.
 - C. Deliver to the Owner duly executed AIA Document A312, "Performance Bond and Payment Bond."
5. The undersigned certifies that this Bid has been prepared independently and is not made in the interests of any undisclosed party. It is submitted without collusion or intent to limit independent, competitive bidding. The Bidder has in no way induced or solicited other Bidders to submit false bids, or to refrain from bidding.
6. The undersigned agrees that the provisions of ORS 279C.515 to 279C.545 and 279C.800 to 279C.970 pertaining to prevailing wage rates will be included in the Agreement if applicable.
7. Indicate below whether Bidder is Resident or Non Resident bidder. "Resident Bidder" means a bidder that has paid unemployment taxes or income taxes in Oregon during the twelve calendar months immediately preceding submission of bid, has a business address in this state and has stated in the bid whether the bidder is a "Resident Bidder" pursuant in 279C.365.
8. The undersigned certifies that you visited the site and thoroughly investigated all existing conditions.
9. Security Deposit
 - a. Bids shall be accompanied by a security deposit as follows: Bid Bond of a sum no less than 10 percent on AIA A310 Bid Bond Form
 - b. Endorse the Bid Bond in the name of Fern Ridge School District as obligee, signed and sealed by the principal (Contractor) and surety
 - c. The security deposit will be returned after delivery to the Fern Ridge School District of the required Performance and Payment Bond by the accepted bidder
 - d. Include the cost of the bid security in the Bid Amount
 - e. If no contract is awarded, all security deposits will be returned.
10. Start of construction after contract execution and permitting is June 15, 2015. Substantial Completion is August 28, 2015. Final Completion is September 4, 2015. (Unless Dates changed by Addenda)
11. If applicable the first tier subcontractor disclosure form is due 2 hours after bid closing.
12. Submittals are due promptly after Letter of Intent. A Pre-Construction Meeting will be held prior to commencement, Weekly Construction meetings are required.

SIGNATURES

Oregon Construction Contractor's Board No. _____ Federal Tax ID: _____

Address: _____

Telephone: _____

Signature: _____

Date: _____

Printed Name: _____

Title: _____

**ATTACHMENT D
FIRST TIER SUBCONTRACTOR DISCLOSURE FORM**

List below the name of each subcontractor that will be furnishing labor or will be furnishing labor and materials and this is required to be disclosed, the category of work that the subcontractor will be performing and the dollar value of the subcontract. Enter "NONE" if there are no subcontractors that need to be disclosed.

Subcontractor Name	Category of Work	Dollar value
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Failure to submit this form by the disclosure deadline (Thursday, July 28, 2016 at 4:00 pm PST) will result in a nonresponsive bid. A nonresponsive bid will not be considered for award.

Respondent Name: _____

Authorized Representative's Signature: _____

Type or Print Name & Title: _____

Date: _____

SECTION 0100 - INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.1 SUBMISSION OF BIDS AND BID OPENING

- A. In accordance with ORS 279C.365, bids will be received by Fern Ridge School District 28-J, and will be opened and read at the time and place set forth in the Bid Document. Bidders, or their representative, and other interested persons may be present at the opening of bids.
- B. The District will accept bids in person at the district office prior to the bid closing date and time.
- C. The Bidder shall assume full responsibility for timely submission of bids.

1.2 BIDDING DOCUMENTS

- A. Bidding Documents are those posted by the district, including attachments and any Addenda issued prior to receipt of bids. All requirements and obligations of the Bidding Documents are hereby incorporated by reference into the Contract Documents and are binding on the Successful Bidder upon award of the Contract.
- B. Bona fide bidders may access Bidding Documents by requesting them through the business office of the Fern Ridge School District
- C. Bidders shall use complete sets of Bidding Documents in preparing Bids. The Owner, Project Manager, and the A/E assume no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- D. The Owner in making copies of the Bidding Documents available on the above terms does so only for the purpose of obtaining Bids on the Work and does not confer a license or grant for any other use.
- E. When boring data (geological) is provided by Bidding Documents, the Contractor shall assume responsibility for any conclusions it may draw from such data. It may employ its own consultants to analyze available information and to conduct additional tests and examinations of site conditions and shall be responsible for any conclusions drawn from such information, tests and examinations. The Owner does not warrant and specifically disclaims any responsibility for the interpretation of any such data or information.

1.3 DEFINITIONS

A. THE BID

- 1. A Bid is a complete and properly signed competitive offer to do the work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

B. BASE BID:

1. The Base Bid is the sum stated in the Bid for which the Bidder offers to perform all the Work shown and described in the Bidding Documents as a lump sum bid, to which Work may be added or deducted for sums stated in Alternate Bids, if any.

C. ALTERNATES:

1. An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents is accepted by the Owner. Any or all Alternates may be accepted or rejected in any order.

1.4 QUALIFICATIONS OF BIDDERS

- A. Only Bidders that have been pre-qualified by RFQ 1.14.16.1 are permitted to submit bids for this work. All other bids will be disqualified
- B. List of Qualified Bidders is shown in section 00 40 05 of the specifications or can be requested from the business office of the Fern Ridge School District.

1.5 BIDDER'S REPRESENTATIONS: Each Bidder by submitting its Bid represents that:

- A. I/We have read and understand the Bidding Documents and its Bid is made in accordance therewith; and Bidder agrees to be bound by the terms and requirements set forth in the Bidding and Contract Documents; B. I/We have visited the site, have familiarized ourselves with the local conditions under which the Work is to be performed in accordance with Paragraph 10 herein, and have correlated our observations with the requirements of the proposed Contract Documents;
- B. Bid is based upon the materials, systems and equipment required by the Bidding Documents without exception; and
- C. I/We have the capability, in all respects, and the moral and business integrity, reliability, technical ability, financial resources, plant, management, superintendence, equipment and materials which will assure effective and efficient good faith performance in full compliance with the Contract Documents and with any and all schedules and completion dates required by the Owner. The Bidder acknowledges and represents that it has made allowances for normal inclement weather indigenous to the Project Site, in estimating, planning and scheduling of the Work. The Bidder further acknowledges that the Contract Documents are, in its opinion, appropriate and adequate for completing this project and for the construction of sound and suitable work. The Bidder hereby certifies that the Work shall be completed, in place, in full accordance with the Contract Documents, within the time limits specified.

1.6 PREPARATION AND SUBMITTAL OF BID FORM

- A. Bids shall be submitted using the online system, and shall be complete in every respect. The total Bid amount shall be entered in written words and figures in the space provided. Amounts for alternates and unit prices should be entered in the spaces provided.
- B. For lump sum Bids, in the event of a discrepancy between the Bid amount in writing and that in figures, the written value shall govern.

- C. Bids shall not contain any restatement or qualifications of work to be done and alternate bids will not be considered unless called for. No oral, telegraphic or telephonic bids or modifications will be considered.
- D. Bids must be submitted by the closing date and time shown on the bidding documents.

1.7 BID SECURITY

- A. If requested, each Bid must be accompanied by a Bidder's Bond on the Form of Bid Bond provided herein or on a similar form which in every respect materially complies with said Form of Bid Bond, in the amount of ten percent (10%) of its Bid. For purposes of this provision, the amount of the Bid shall be the Base Bid. The Bidder's Bond shall be issued by a Surety company licensed to conduct business in the State of Oregon and be acceptable to the Owner. The Surety signing the Bidder's Bond shall be registered with the Oregon State Insurance Commissioner, and the Surety's name shall appear in the current Authorized Insurance Company list in the State of Oregon published by the office of the Insurance Commissioner. Each Surety's name must also appear on the United States Treasury Department's list of authorized sureties, circular 570, as amended.

Bidders are to attach a copy of the bid security to their response. Bidders are required to provide contact information for the bonding company so the District can verify the bond is authentic. Failure to provide valid contact information may result in rejection of the bid.

- B. Said Bid Security is given as a guarantee that the Bidder will enter into a Contract if awarded the Work and, in the case of refusal or failure to so enter into said Contract, the Bid Security shall be declared forfeited to the Owner, in accordance with ORS 279C.385. Such Bid Security shall be returned to all but the three (3) lowest Bidders after the opening of the Bids and the remaining Bid Security will be returned after the Owner and the successful Bidder have executed the Contract. If no Contract has been awarded or the Bidder has not been notified of the acceptance of its Bid, within sixty (60) days of the Bid opening, the Bidder may withdraw its Bid and request the return of its Bid Security. If, at the Owner's or Project Manager's request, the Bidder agrees to extend and maintain its Bid beyond the specified sixty (60) days, its Bid Security will not be returned until after the Owner and the Successful Bidder have executed the Contract.
- C. The successful Bidder, upon their failure or refusal to execute the Contract within ten (10) days after it has received Notice of Acceptance of its Bid, shall forfeit to the Owner the Bid Security deposited with its Bid, as liquidated damages for such failure or refusal.

1.8 INSURANCE BINDER

- A. The successful bidder is required to provide a certificate of insurance within five days of bid award, for the coverage specified elsewhere in the bidding documents.

1.9 UNIT PRICES

- A. The Bidder shall include in the spaces provided on the Bid Form a Bid for each unit price.
- B. The Owner may accept or reject any or all of these unit prices and include them in the Contract.
- C. The Owner is not obligated to use these unit prices and may require the Contractor to provide complete breakdown of costs listed therein.

1.10 SITE CONDITIONS AND CONDITIONS OF THE WORK

- A. Each Bidder must acquaint themselves thoroughly as to the character and nature of the Work to be done and the conditions under which the work will be performed. Each Bidder furthermore must make a careful examination of the site of the Work and inform themselves fully as to the difficulties to be encountered in the performance of the Work, the facilities for delivering, storing and placing materials and equipment, existing and available services and utilities, environmental and access constraints, permit requirements and other conditions relating to construction and labor.
- B. The Successful Bidder, assumes all risk as to the nature and behavior of the soil or subsurface conditions which underlie the Work or is adjacent thereto, or difficulties that may be due to any unfavorable conditions that may be encountered in the Work, whether apparent on surface inspection or disclosed after construction begins.
- C. No plea of ignorance of conditions that exist or may hereafter exist on the site of the Work, or difficulties that may be encountered in the execution of the Work, as a result of failures to make necessary investigations and examinations, will be accepted as an excuse for any failure or omission on the part of the Successful Bidder to fulfill in every detail all the requirements of the Contract Documents and to complete the Work for the consideration set forth therein, or as a basis for any claim whatsoever.
- D. Insofar as possible, the Successful Bidder, in carrying out its work, must employ such methods or means as will not cause interruption of or interference with the Work of the Owner, the Project Manager or any separate Contractor.
- E. The Contract includes excavation on an unclassified basis. The cost of all excavation and backfill required under this Contract is a part of the Base Bid. No distinction will be made insofar as payment is concerned between earth and rock.

1.11 BIDDER'S QUESTIONS, ADDENDA, AND BID INTERPRETATIONS

- A. Bidder's and Sub-Bidders shall promptly notify the Owner through the A/E of any ambiguity, inconsistency, or error, which they may discover upon examination of the Bidding and Contract Documents or of the site and local conditions. No interpretation of the meaning of the drawings, specifications or other Contract Documents will be made to any Bidder orally.
- B. Every request for such interpretation shall be in writing addressed to the Project Manager, utilizing Section 00210 form, and to be given consideration must be received at least ten (10) days prior to the date fixed for the opening of the Bids, or two days after the mandatory pre-bid, whichever occurs last.
- C. Any and all such interpretations and any supplemental instruction will be in the form of written addenda to the Bidding Documents which, if issued, will be posted on the online bidding system not later than three (3) calendar days prior to the date fixed for the opening of the Bids. Neither the Project Manager nor the Owner will be responsible for any other explanations or interpretations of the proposed documents. Failure of any Bidder to receive any such addendum or interpretation shall not relieve the Bidder from any obligation under its Bid as submitted. All addenda so issued shall become a part of the Contract Documents.

- D. If the Bidder (or any person bidding to Bidder and/or subsequently in contract with the Bidder, relating to the subject project) knows, or should have known, that an ambiguity, discrepancy, error, omission or conflicting statement exists in the Bidding or Contract Documents, said Bidder has an obligation to seek a clarification thereof from the A/E prior to the Bid. The Owner will welcome such a clarification request, and, if deemed necessary by the Owner, the Project Manager or A/E, the Purchasing Department will issue a written addendum clarifying the matter in question.

1.12 SECURITY FOR FAITHFUL PERFORMANCE

- A. If requested, the Successful Bidder shall furnish a Performance and Payment Bond in an amount equal to one hundred percent (100%) of the Contract sum, as security for the faithful performance of this Contract and as security for the payment of all persons performing labor and furnishing materials under this Contract. The Performance and Payment Bond shall be acceptable to the Owner, in accordance with State law and shall be delivered to the Owner not later than the date of execution of the Contract. The Surety signing the Bond shall be registered with the Oregon State Insurance Commissioner, and the Surety's name shall appear in the current Authorized Insurance Company list in the State of Oregon published by the office of the Insurance Commissioner. The Surety's name must also appear on the United States Treasury Department's list of authorized sureties, circular 570, as amended. No Work shall commence at the project site until approved Bonds are received by the Owner. Both bonds shall be in compliance with ORS Sections 279C.380, 279C.625 and 701.430.

1.13 TIME FOR COMPLETION

The time for completion of this Contract shall be as listed on the Construction Milestone Schedule in section 00 40 10 of the specifications and as fixed in the Owner-Contractor Agreement.

1.14 LOCATION OF THE WORK

The site of the proposed work is on Owner owned property, public streets, easements and/or other right-of-ways, as shown on the drawings.

1.15 LIABILITY INSURANCE AND WORKER'S COMPENSATION

The Successful Bidder will be required to carry public liability and worker's compensation and other insurance in the amounts and under the terms stipulated under the General Conditions. No Work shall commence at the project site until approved Certificates are received by the Owner. Limits of liability and general aggregate coverage limits shall apply on a per project basis.

1.16 BIDDERS REFERRED TO LAWS

- A. The attention of the Bidders is called to the provisions of all Local, State and Federal laws, regulations, ordinances and resolutions applicable to the work, as well as laws, regulations, ordinances, resolutions and permits relating to obstructing streets, maintaining signals, storing and handling of explosives, preserving safety or affecting the Bidder, or its employees or its work hereunder in its relation to the Owner or any other person. The Bidder shall obey all such laws, regulations, ordinances, permits or resolutions applicable to the Work or controlling or limiting Contractors while engaged in the prosecution of the Work under this Contract.

- B. The provisions of this Contract shall be interpreted in accordance with the laws of the State of Oregon and in accordance with the laws, ordinances, regulations, permits and resolutions of Marion County.

1.17 TAXES

Contractor shall include in its Bid and pay for all applicable taxes. Refer to General Conditions regarding further discussion. Certification of Compliance with Oregon tax laws is required to be submitted prior to commencement of work.

1.18 RIGHT TO REJECT BIDS

The Owner expressly reserves the right to reject any or all Bids, to waive any informalities or irregularities in the Bids received, and to accept that Bid which in its judgment, best serves the interest of the Owner.

1.19 MODIFICATION AND WITHDRAWAL OF BID

- A. A Bidder may withdraw its Bid from consideration if the price Bid was substantially lower than the other Bids due solely to a mistake therein, provided: (1) the Bid was submitted in good faith; and (2) the mistake was a clerical mistake as opposed to a judgment mistake, and; (3) the mistake was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor or material made directly in the compilation of a Bid, which unintentional error or omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents and materials used in the preparation of the Bid sought to be withdrawn. The Bidder shall give notice in writing of its claim of right to withdraw its Bid within two (2) business days after the conclusion of the Bid opening procedure.
- B. Prior to the time and date designated for the receipt of Bids, any Bid submitted may be retracted by the Bidder.
- C. Withdrawn Bids may be resubmitted up to the time designated for the receipt of the Bids provided that they are then fully in conformance with these Instructions to Bidders.
- D. Bid security, if any is required, shall be in an amount sufficient for the Bid as modified or resubmitted.

1.20 DETAILED BID BREAKDOWN

- A. Upon notification from the Owner or the Project Manager to the Bidder that submitted the apparent lowest responsive Bid, the Bidder shall, within forty-eight (48) hours, provide a detailed breakdown of its Bid in a form acceptable to the Owner or Project Manager.
- B. The breakdown may be used by the Owner to verify accounting requirements, and to determine whether the Bidder has grossly misjudged the requirements of any area.
- C. The Bidder's failure to provide the requested detailed breakdown in the specified time may result in rejection of the Bid at the sole discretion of the Owner.

1.21 AWARD OF CONTRACT

The Contract will be awarded to the lowest responsive and responsible Bidder whose Bid is considered to be in the best interest of the Owner. After the Owner determines that a contract is to be awarded, it will award the contract to the lowest responsible bidder. The "lowest responsible bidder" will be the lowest bidder who has substantially complied with all bidding requirements and procedures and who has not been disqualified by the Owner under ORS 279C.375. In determining the lowest responsible bidder, the Owner shall add a percentage increase of the bid of nonresident bidder as required by ORS 279A.120.

- A. The Lowest Bidder is determined by the aggregate amount of the Base Bid, plus any Alternates selected by the Owner or Project Manager.
- B. A Responsive Bidder shall mean a Bidder who has submitted a Bid, which conforms, in all material respects, to the Bidding Documents.
- C. A Responsible Bidder shall mean a Bidder who has the capability, in all respects, to perform fully the Contract requirements and the moral and business integrity and reliability, which will assure good faith performance. In determining responsibility, the following criteria will be considered:
 - 1. The ability, capacity and skill of the Bidder to perform the Contract or provide the services required;
 - 2. Whether the Bidder can perform the Contract or provide the service promptly, or within the time specified, without delay or interference;
 - 3. The character, integrity, reputation, judgment, experience and efficiency of the Bidder;
 - 4. The quality of performance of previous contracts or services. For example, the following information will be considered:
 - a. The administrative and consultant cost overruns incurred by Owners on previous contracts with Bidder,
 - b. The Bidder's compliance record with Contract General Conditions on other projects,
 - c. The submittal by the Bidder of excessive and/or unsubstantiated extra costs proposals and claims on other projects,
 - d. The Bidders record for completion of the work within the Contract time or within Contract milestones and Bidders compliance with scheduling and coordination requirements on other projects,
 - e. The Bidder's demonstrated cooperation with the Owner, the Project Manager, or the A/E and other Contractors on previous contracts,
 - f. Whether the work performed and materials furnished on previous contracts were in accordance with the Contract Documents;

5. The previous and existing compliance by the Bidder with laws, regulations, resolutions and ordinances relating to contracts or services;
6. The sufficiency of the financial resources and ability of the Bidder to perform the Contract or provide the services;
7. The quality, availability and adaptability of the goods or services to the particular use required;
8. The ability of the Bidder to provide future maintenance and service for the warranty period of the Contract;
9. Whether the Bidder is or has been in arrears to the Owner on debt or contract or is or has been a defaulter on surety to the Owner;
10. Such other information as may be secured by the Owner or the Project Manager having a bearing on the decision to award the Contract, to include, but not limited to:
 - a. The ability, experience and commitment of the Bidder to properly and reasonably plan, schedule, coordinate and execute the Work,
 - b. Whether the Bidder has ever been debarred from bidding or found ineligible for bidding on any other projects.

- D. The purpose of the above is to enable the Owner or the Project Manager in its opinion, to select the Bid that is in the best interest of the Owner. The ability of the low Bidder to provide the required bonds will not of itself demonstrate responsibility of the Bidder.
- E. The Owner reserves the right to require from the Bidder: (1) submission of references, within seventy-two (72) hours, to include a listing of previous and current projects and (2) financial statements indicating current financial status, prepared in accordance with generally accepted accounting principles, by a CPA licensed to do business in the State of Oregon.
- F. The Owner reserves the right to defer award of this Contract for a period of sixty (60) days after the due date of the Bids. During this period of time, the Bidder shall guarantee the prices quoted in its Bid.

1.22 BID PROTEST

Any actual bidder who is adversely affected or aggrieved by the Owner's notice of award of the contract to another bidder on the same solicitation shall have seven (7) calendar days after notice of award to submit to the Owner a written protest of the notice of award. The written protest shall specify the grounds upon which the protest is based. In order to be an adversely affected or aggrieved with the right to submit a written protest, a bidder must itself claim to be eligible for award of the contract as the lowest responsible bidder and must be next in line for award, i.e., the protestor must claim that all lower bidders are ineligible for award because they are non-responsive or non-responsible. The Owner will not entertain a protest submitted after the time period established in this provision.

The Owner's designee shall have the authority to settle or resolve the written protest. If the protest is not settled or resolved by mutual agreement, the Owner's designee shall promptly issue a written decision on the protest.

1.23 SUBCONTRACTORS

- A. All Subcontractors proposed for the Work must be acceptable to the Owner.
- B. Contractor shall comply with ORS 279C.580, a copy of which is hereto attached under Section 00667.
- C. The Owner reserves the right to request the proposed Subcontractors to complete Bidder Qualification Forms and/or current financial statements prepared by a Certified Public Accountant. These forms will be similar to those required of a Bidder under Instruction to Bidders.
- D. In accordance with ORS 279A.110
 - (1) A bidder or proposer who competes for or is awarded a public contract may not discriminate against a subcontractor in the awarding of a subcontract because the subcontractor is a minority, women or emerging small business enterprise certified under ORS 200.055.
 - (2) The public contracting agency may debar or disqualify under ORS 279C.440 any person as a bidder on a public contract if the agency finds that the person has violated subsection (1) of this section in a contract between the person and the agency.
 - (3) If the person desires to appeal the disqualification, the appeal procedure shall be subject to ORS 279C.445 to 450.

1.24 PREVAILING WAGE RATES

- A. If applicable, labor required for the construction of this project is subject to the prevailing wage rates as provided in the General Requirements.
- B. Contractors working on public works projects must obtain and file with the Construction Contractors Board (CCB) a public works bond with a corporate surety authorized to do business in Oregon for the amount of \$30,000 before starting work on a contract or subcontract for a public works project, unless exempt. (Mandated by SB477 2005)

1.25 PRE-BID CONFERENCE

- A. When scheduled, a Pre-Bid Conference will be conducted by the Project Manager in conjunction with the A/E at the time indicated in the Advertisement for Bids to afford Bidders the opportunity to question the Owner, the Project Manager, and the A/E.

The meeting will be held at the location identified in the Bidding Documents. Sign-in will begin 15 minutes prior to start of meeting. Bidders must be signing in by no later than 10 minutes after meeting start time. Any bidders not signing in by that time may be deemed late and not eligible to submit a bid. The District reserves the right to consider unusual or extenuating circumstances

1.26 INSPECTION AND LABORATORY TESTING

- A. Inspection and Laboratory Testing shall be provided as called for in the General Requirements and Technical Specifications by a Testing Consultant to be retained by the Owner.

1.27 PROGRESS PAYMENTS

- A. Monthly progress payments will generally be made to the Contractor by the Owner within thirty (30) days after approval of the Certificate of Payment by the Owner.
- B. The Owner will retain funds from progress payments as described in General Conditions and in accordance with ORS 279C.550 through 279C.570.

1.28 SUBSTITUTIONS

The attention of potential bidders and other interested parties is called to the conditions set forth in Division 1, Section 01600, "Material and Equipment", regarding approval and product options for substitutions. All requests for substitutions must be submitted on the form provided in the bidding documents.

1.29 DRUG TESTING PROGRAM FOR PUBLIC IMPROVEMENT CONTRACTS

Pursuant to ORS 279C.505, District's performance under this contract is conditioned upon the Contractor's compliance with the following Contractor representations and warranties.

Contractor represents and warrants the following:

- A. That Contractor has at the time of the execution of this contract and shall maintain during the term of this contract, an employee drug testing program for its employees that includes, at a minimum, the following:
 - (1) A written employee drug-testing policy,
 - (2) Required drug testing for all new Subject Employees or alternatively, required testing of all Subject Employees every six (6) months on a random selection basis,
 - (3) Required testing of a Subject Employee when the Contractor has reasonable cause to believe the Subject Employee is under the influence of drugs, and
 - (4) Required testing of a Subject Employee when the Subject employee is involved in:
 - (i) an incident causing an injury requiring treatment by a physician, or
 - (ii) an incident resulting in damage to property or equipment.

A drug-testing program that meets the above requirements will be deemed a "Qualifying Employee Drug-testing Program." For the purposes of this section, an employee is a "Subject Employee" only if that employee will be working on the

Project job site; and

- B. That Contractor shall require each subcontractor providing labor for the Project to:

- (1) Demonstrate to the Contractor that it has a Qualifying Employee Drug- testing Program for the subcontractor's Subject Employees, and represent and warrant to the Contractor that the Qualifying Employee Drug-testing Program is in place at the time of subcontract execution and will continue in full force and effect for the duration of the subcontract, or
- (2) Require the subcontractor's Subject Employees participate in the Contractor's Qualifying Employee Drug-testing Program for the duration of the subcontract.

1.30 BACKGROUND CHECKS

- A. Contact with Students. "Unsupervised contact" with students means contact that provides the person opportunity and probability for personal communication or touch with students when not under direct District supervision. As required by ORS 326.603, Contractor shall ensure that Contractor, any subcontractors, and their officers, employees, and agents will have no direct, unsupervised contact with students while on District property. Contractor shall work with District to ensure compliance with this requirement. If (1) the work site is not a "closed site" as described below, and (2) Contractor is unable to ensure through a security plan that none of its officers, employees, or agents or those of its subcontractors will have direct, unsupervised contact with students in a particular circumstance or circumstances, then Contractor shall notify District before beginning any Work that could result in such contact. Contractor authorizes District to obtain information about Contractor and its history and to conduct a criminal background check, including fingerprinting, of any Contractor officers, employees, or agents who may have unsupervised contact with students. Contractor shall cause its employees and/or subcontractors, if any, to authorize District to conduct these background checks. Contractor shall pay all fees assessed by Oregon Department of Education for processing the background check. District may deduct the cost of such fees from a progress or final payment to Contractor under this Contract, unless Contractor elects to pay such fees directly. All Contractors and their employees whether full time or part time working at closed sites must undergo a criminal history verification for disqualifying convictions per ORS 342.143 Criminal history verification checks will be conducted at the Contractor's expense, by the Fern Ridge School District or an approved third party vendor.

Closed Sites. At district sites that are closed for construction or other purposes, Contractor fingerprinting is not required. However, all Contractors and their employees whether full time or part time working at closed sites must undergo a criminal history verification for disqualifying convictions per ORS 342.143 Criminal history verification checks will be conducted at the Contractor's expense by the Fern Ridge School District or an approved third party vendor. Prior to entry of a Contractor's employees onto a jobsite, the Contractor shall provide a list of its employees who have successfully undergone the criminal history verification check.

END OF DOCUMENT 00100

SECTION 00200 – INFORMATION AVAILABLE TO BIDDERS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUBSURFACE INVESTIGATION REPORT

A copy of the asbestos report is available for review at the District Office.

These reports by their nature cannot reveal all conditions that exist on the site. The Contractor shall make his own deductions and conclusions as to the nature of the materials to be excavated; the difficulties, which may arise from subsurface conditions, and of doing any other work, affected by the subsurface conditions, and shall accept full responsibility.

The owner does not warrant the correctness of the soil investigation or of any interpretation, deduction or conclusion given in the report relative to subsoil conditions.

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 00200

SECTION 00300 – CONTRACTORS REQUEST FOR INFORMATION

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for contractors request for information.

Construction schedules are specified in another Division-1 Section.

Project Meetings are specified in another Division – 1 Section.

Submittals are specified in another Division-1 Section.

Product Substitutions are specified in another Division-1 Section.

DEFINITION

Request for Information is a request from the contractor or one of its subcontractors, to the architect, seeking an interpretation or a clarification of some requirement of the contract documents. The contractor shall clearly and concisely set forth the issue for which it seeks clarification or interpretation and why a response is needed from the architect. The contractor shall, in the written request, set forth its interpretation or understanding of the contract's requirements along with reasons why it has reached such an understanding. Responses from the architect will not change any requirements of the contract documents.

Drawing/Plan Clarifications: An answer from the architect, in response to an inquiry from the Contractor, intended to make some requirement(s) of the drawings clearly understood. Drawing/Plan Clarifications may be sketches, drawings, or in narrative form and will not change any requirements of the drawings or plans. Responses to Contractor inquiries shall be as outlined in "Request for Information."

CONTRACTOR'S REQUESTS FOR INFORMATION

- A. When field conditions or contents of contract documents require clarification or verification by Architect, the following procedure is required.

Present item or items requiring clarification/verification at Progress Meeting for discussion (Critical or emergency items contact Architect at once.)

If it is determined that item or items do not require RFI submittals, Contractor shall include clarification/verification determination in Progress Meeting Report.

If it is determined that item or items do require written RFI submittal, prepare each RFI on a copy of the form bound at the end of this section. Design clarification/verification request or other forms are unacceptable.

Number RFI's sequentially from number 1. RFI forms available from Architect upon request. Record each RFI in an RFI log, identifying each RFI #, subject, and date submitted, date of response, decisions, & impacts.

- B. Contractor shall endeavor to keep the number of RFI's to a minimum. In the event that the process becomes unwieldy, in the opinion of the architect, because of the number and frequency of RFI's submitted, the Architect may require the Contractor to abandon the process and submit all requests as either submittals, substitutions, or requests for change. If the Contractor continues with excessive RFI's the Architect may charge the contractor at the standard hourly rate of \$75.00 per hour to handle such RFI's.
- C. RFI's shall be submitted on a copy of the form provided at the end of this section. Forms shall be completely filled in, and if prepared by hand, shall be fully legible after copying by xerographic process. Each page of attachments to RFI's shall bear the RFI number in the upper left hand corner.
- D. The Contractor shall endeavor to answer all RFI's from subcontractors. Only RFI's the contractor cannot answer shall be submitted through, reviewed by, numbered sequentially by and signed by the Contractor prior to submittal to the Architect.
- E. Contractor shall carefully study the Contract Documents to assure that the requested information is not available therein. The Architect will not answer RFI's, which request information available in the Contract Documents.
- F. In all cases where RFI's are issued to request clarification or coordination issues, for example, piping or duct routing, clearances, specific locations of work shown diagrammatically, and similar items, the Contractor shall fully layout a suggested solution using drawings or sketches drawn to scale and submit same with the RFI. RFI's, which fail to include a suggested solution, will not be answered.
- G. RFI's shall not be used for the following purposes:
 - To request approval of submittals.
 - To request approval of substitutions.
 - To request changes which entail additional cost or credit.
 - To request different methods of performing work than those drawn and specified.
- H. In the event the Contractor believes that a clarification by the Architect results in additional costs, Contractor shall not proceed with the work indicated by the RFI until the Project Manager approves a change order request. **Answered RFI's shall not be construed as an approval to perform extra work.**

Unanswered RFI's will be returned with a stamp or notation, not reviewed.

Contractor shall prepare and maintain a log of RFI's and at any each pay request report, and any time requested by the Architect or Project Manager, Contractor shall furnish copies of the log showing all outstanding RFI's. Contractor shall note all unanswered RFI's in the log.

Contractor shall allow 14 days for review and response to RFI's.

RFI's prepared during the bidding stage are not considered RFI's and only addendum responses shall be valid.

END OF SECTION 00300

CONTRACTORS REQUEST FOR INFORMATION 00300-2

FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS: That we, _____ as Principal and _____ a Corporation duly organized and existing under the laws of the State of _____ and legally doing business in the State of Oregon, a surety, are held and firmly bound and obligated unto the **Fern Ridge School District 28J**, and the State of Oregon, hereinafter called the **Owner**, in the full and just sum of _____ Dollars(\$ _____), lawful money of the United States of America for

the payment of which sum of money well and truly to be made, the said Principal and Surety bind themselves, their and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

Signed, Sealed and Dated this _____ day of _____ 20____ A.D.,

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Owner shall make any award to the Principal for the **District Office Remodel project** according to the terms of the proposal or bind made by the Principal therefore, and the Principal shall duly make and enter into a Contract with the Owner in accordance with the terms of said proposal or bid and award and shall give bond for the faithful performance thereof, with Surety and Sureties approved by the Owner; or if the Principal shall, in case of failure to do so, pay to the Owner the damages which the Owner may suffer by reason of such failure not exceeding the penalty of this bond, then this obligation shall be null and void; otherwise it shall be and remain in full force and effect.

IN TESTIMONY WHEREOF, the Principal and Surety have caused these presents to be duly signed and sealed.

Principal

By

Surety

By Attorney-in-Fact

SEAL AND NOTARIAL ACKNOWLEDGMENT OF SURETY

SECTION 00410 – CONSTRUCTION MILESTONE SCHEDULE

**Construction Milestone Schedule
District Office Remodel
Fern Ridge School District**

<u>Key Dates</u>	<u>Date</u>
1. Intent to Award	7/29/2016
2. Notice to Proceed	8/8/2016
3. Substantial Completion	10/28/2016
4. Final Completion	11/18/2016

CONSTRUCTION CONTRACT

*Where the basis of payment is a
STIPULATED SUM*

AGREEMENT made as of: April 4th, 2016

BETWEEN the District: Fern Ridge School District 28J
88834 Territorial Rd
Elmira, OR 97437

And the Contractor: EXAMPLE Construction, Inc.
123 Main St
Somewhere, USA

The Project is: District Office Remodel

In consideration of the covenants herein below set forth, EXAMPLE Construction, Inc., hereafter referred to as CONTRACTOR, and the FERN RIDGE SCHOOL DISTRICT 28J, hereafter referred to as DISTRICT, mutually contract as follows:

- A. CONTRACTOR agrees and covenants to perform all work indicated for the general construction services for the project as described in the contract documents for the District Office Remodel, for a total sum price of \$X,XXX,XXX.
- B. CONTRACTOR agrees to complete full performance for all work under the contract in accordance with all terms, plans, and specifications in the contract documents. The project will be complete by the dates stipulated by the contract documents and as shown in Exhibit 1.
- C. Payment shall be due on a monthly basis throughout the duration of the project. The DISTRICT shall make progress payments based on a percent completion of the work, within 30 days, when CONTRACTOR submits evidence satisfactory to the DISTRICT of having appropriately paid all payrolls, material bills, and other indebtedness connected with the work, and of having fully complied with all laws and terms of the contract. Payment shall be made promptly in accordance with ORS 279C.505, and both parties shall have all the rights and duties specified in ORS 279C.515 (incorporated herein by this reference), and including the right to withhold retainage, as specified in ORS 279C.550 – ORS 279C.580.
- D. CONTRACTOR agrees that the DISTRICT shall not be responsible or liable for any payment for additional work or cost over the contract total. The DISTRICT must preapprove, in advance and in writing, any necessary work beyond this contract total. The DISTRICT, in its discretion, may require the execution of a contract amendment by the parties prior to any obligation to pay for additional work, or may issue an amended purchase order. Any DISTRICT obligation to pay is conditioned upon the work being performed in accordance with this contract, subject to its terms unless specified otherwise, and performed satisfactorily at the direction of the DISTRICT. Any payment is

limited to compensation for actual quantities of work performed or other specified payment basis, taking into account any amounts that may be deductible under this contract.

- E. CONTRACTOR shall comply with all provisions of the Standard Contract Provisions, attached as appendix B and incorporated by this reference, and the Fern Ridge School District General Provisions.
- F. Each worker in each trade or occupation employed in the performance of the contract either by the CONTRACTOR, subcontractor, or other person doing, or contracting to do, or contracting for the whole or any part of the work on the contract, must be paid not less than the applicable state prevailing rate of wage. CONTRACTOR must pay daily, weekly, weekend and holiday overtime as specified in law. The BOLI rates in effect on the date of the execution of the contract shall be the applicable BOLI Prevailing Wage Rate and will be the rate fixed for the duration of the project. Once before the first payment, and once each week thereafter, and once before final payment of any sum due hereunder, CONTRACTOR, any subcontractor or their sureties, shall file a certificate of rate of wage as required by ORS 279C.845. If the DISTRICT determines at any time that the prevailing rate of wages has not or is not being paid as required herein, it may retain from the moneys due to CONTRACTOR an amount sufficient to make up the difference between the wages actually paid and the prevailing rate of wages, and may also cancel the contract. CONTRACTOR shall be liable to the workers affected for failure to pay the required rate of wage in the amount of their unpaid minimum wages, including all fringe benefits under ORS 279C.840(5), and in an additional amount equal to said unpaid wages as liquidated damages. CONTRACTOR shall include a contract provision in compliance with this paragraph in every subcontract, and shall require each subcontractor to include in each additional subcontract or contract. Within 20 days of the end of any month in which work was performed, CONTRACTOR shall provide the DISTRICT with a completed WH 38 BOLI payroll form. Reports should be mailed to Quanah Bennett, Business Manager, Fern Ridge School District, 88834 Territorial Rd, Elmira, OR 97437, or emailed to qbennett@fernridge.k12.or.us.
- G. The DISTRICT will retain 5% of any amount earned by CONTRACTOR on the project until CONTRACTOR has filed the certified statements required weekly. The DISTRICT will pay to CONTRACTOR the amount retained within 14 days after CONTRACTOR files the required certified statements, regardless of whether a subcontractor has failed to file certified statements. As required in ORS 279C.845, CONTRACTOR shall retain 5% of any amount earned by a first tier subcontractor on the project until the first tier subcontractor has filed with the DISTRICT the certified statements required by this agreement. Before paying any amount retained, CONTRACTOR shall verify that the first tier subcontractor has filed the certified statement. Within 14 days after the first tier subcontractor files the required certified statement, CONTRACTOR shall pay the first tier subcontractor any amount retained. CONTRACTOR shall require all other subcontractors to file certified statements regarding payment of prevailing wage rates with the DISTRICT.
- H. If the CONTRACTOR or a first-tier subcontractor fails, neglects or refuses to make payment to persons furnishing labor or materials in connection with the public contract for a public improvement within 30 days after receipt of payment from the public contracting agency or a contractor, the CONTRACTOR or first tier subcontractor shall owe the person the amount due plus interest commencing at the end of the 10-day period that payment is due under ORS 279C.580(3)

and ending upon final payment, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest shall be as provided in ORS 279C.515 (2).

- I. CONTRACTOR shall include in each subcontract for labor or services in connection with a public improvement, including a material supplier, for the purpose of performing a construction contract:
 1. A payment clause that obligates the CONTRACTOR to pay the first-tier subcontractor for satisfactory performance under its subcontract within 10 days out of such amounts as are paid to the CONTRACTOR by the public contracting agency under such contract, and
 2. An interest penalty clause that obligates the CONTRACTOR, if payment is not made within 30 days after receipt of payment from the public contracting agency to pay to the first-tier subcontractor an interest penalty on amounts due in the case of each payment not made in accordance with the payment clause included in the subcontract pursuant to paragraph (1) above for the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made and computed at the rate specified in ORS 279C.515. The rate of interest charged to the contractor or first-tier subcontractor on the amount due shall equal three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is 30 days after the date when payment was received from the public contracting agency or from the contractor, but the rate of interest shall not exceed 30 percent. A contractor or first-tier subcontractor shall not be obligated to pay an interest penalty if the only reason that the contractor or first-tier subcontractor did not make payment when payment was due is that the contractor or first-tier subcontractor did not receive payment from the public contracting agency or contractor when payment was due.
 3. Terms and conditions that include prevailing wage payments, as detailed in Paragraph F of this section.
- J. If CONTRACTOR or subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the public contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580.
- K. The CONTRACTOR shall require that the first-tier subcontractor include clauses in I.1-3 and J. above in each of its subcontracts, and that each lower-tier subcontractor or supplier include such clauses in each additional subcontract.
- L. The CONTRACTOR and each subcontractor shall have a public works bond in the amount of \$30,000 filed with the Construction Contractors Board before starting work, unless exempt. CONTRACTOR shall provide certification that CONTRACTOR and all subcontractors have filed the required public works bond.
- M. The performance under this contract is at CONTRACTOR'S sole risk. The service or services to be rendered under this contract are those of an independent contractor who is not an officer, employee, or agent of THE DISTRICT as those terms are used in ORS 30.265. Notwithstanding the Oregon Tort Claims Act, except as they apply to CONTRACTOR, or provisions of any other contract, CONTRACTOR is acting as and assumes liability of an independent contractor as to claims between the DISTRICT and CONTRACTOR. CONTRACTOR is solely liable for any Workers' Compensation coverage, social security, unemployment insurance or retirement payments, and federal or state

taxes due as a result of payments under this contract. Any subcontractor hired by the CONTRACTOR shall be similarly responsible.

- N. CONTRACTOR agrees to indemnify, defend and hold the DISTRICT, its Board, agents, officers and employees, harmless and defend all damages, losses and expenses included but not limited to attorney's fees, and to defend all claims, proceedings, lawsuits and judgments arising out of or resulting from the fault of the CONTRACTOR, the CONTRACTOR'S agents, representatives or subcontractors, in the performance of or failure to perform this contract. However, CONTRACTOR shall not be required to indemnify any indemnitee to the extent the damage, loss or expense is caused by the indemnitee's negligence.
- O. By execution of this contract, CONTRACTOR certifies under penalty of perjury that to the best of CONTRACTOR'S knowledge, CONTRACTOR is not in violation of any tax laws described in ORS 305.380(4) and CONTRACTOR has not discriminated against minority, women or small business enterprises in obtaining any required subcontract.
- P. CONTRACTOR may only substitute a first-tier subcontractor that was not disclosed under ORS 279C.370 in accordance with statutory criteria, including demonstration of inadvertent error, the subcontractor's failure or refusal to execute or perform under a written contract, to meet bond requirements, to perform substantially satisfactory work or affirmatively causing substantial delay or disruption to work progress, subcontractor's bankruptcy or insolvency, or failure to be registered with Construction Contractors Board if required, or otherwise be eligible to work on a public improvement project pursuant to applicable statutory provisions. CONTRACTOR is solely responsible for ensuring that any subcontractor selection and substitution has been in accordance with all legal requirements, including compliance with lobbying disclosure and federal debarment restrictions. The DISTRICT shall not be liable, either directly or indirectly, in any dispute arising out of CONTRACTOR'S actions with regard to subcontractor selection and substitution.
- Q. The DISTRICT reserves the right to reject any bid or to refuse delivery of materials or services at or from any manufacturer, plant, or contractor with which the DISTRICT has reasonable grounds to believe is or may be operating in violation of any local, State or Federal laws or which is the subject of pending litigation.
- R. In order to induce the DISTRICT to enter into this Agreement CONTRACTOR makes the following representations:
1. CONTRACTOR has examined and carefully studied the contract documents and the other related data.
 2. CONTRACTOR has visited the sites and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, and performance of the project.
 3. CONTRACTOR is familiar with and is satisfied as to all federal, state, and local laws and regulations that may affect cost, progress, and performance of the project.
 4. CONTRACTOR has obtained and carefully studied (or assumes responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and underground facilities) at or contiguous to the site which may affect cost, progress, or performance of the project or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, including any specific means, methods, techniques, sequences,

and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto.

5. CONTRACTOR does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the project at the contract price, within the contract times, and in accordance with the other terms and conditions of the contract documents.
 6. CONTRACTOR is aware of the general nature of work to be performed by the DISTRICT and others at the site that relates to the project as indicated in the contract documents.
 7. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the site, reports and drawings identified in the contract documents, and all additional examinations, investigations, explorations, tests, studies, and data with the contract documents.
 8. CONTRACTOR has given the DISTRICT written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the contract documents, and the written resolution thereof by the DISTRICT is acceptable to CONTRACTOR.
 9. The contract documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the project.
- S. By execution of this agreement, CONTRACTOR agrees to be bound by all the contract documents.
1. The contract documents consist of the following:
 - a) This Construction Contract and the attached standard provisions (Appendix B)
 - b) Drawings and project manuals
 - c) Any addenda issued
 - d) Contractors' Bid
 - e) Modifications issued after execution of the Contract. Modifications may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto.
 2. A modification is (1) an amended Purchase Order, (2) a written amendment to the Contract, (3) a Field Order including the Notice to Proceed, (4) a Change Order, (5) a Change Directive, (6) or a written order for a minor change in the Work issued by the Engineer.
 3. Contract documents do not include other documents, or portions of documents, covering bidding requirements, bidding instructions or sample forms.
 4. Any conflict or difference between the contract documents shall be called to the attention of THE DISTRICT by CONTRACTOR before proceeding with affected work. In the event that any conflict arises because of differences among the documents listed in Section S.1., the order of precedence shall be in the order listed in Section S.1.
- T. CONTRACTOR shall provide all insurance called for in Appendix A Insurance Coverage Required and Section G of the general conditions. As evidence of the insurance coverage required by this contract, the CONTRACTOR shall furnish a certificate of insurance to the DISTRICT. The certificate will specify parties who are Additional Insured and must include a notice provision regarding cancellations. Insurance coverage required under this contract shall be obtained from insurance companies authorized to do business in the State of Oregon. If CONTRACTOR is self-insured under the laws of the State of Oregon, CONTRACTOR shall provide appropriate declarations of coverage.
1. CONTRACTOR shall not cancel, materially change, or not renew insurance coverages. CONTRACTOR shall notify the DISTRICT, of any material reduction or exhaustion of aggregate limits. Should any policy be cancelled before final payment to the DISTRICT and should CONTRACTOR fail to immediately procure other insurance as specified, the DISTRICT reserves

the right to procure such insurance and charge CONTRACTOR for the cost thereof. Any insurance bearing any adequacy of performance shall be maintained after completion of the contract for the full guaranteed period, and should the CONTRACTOR fail to immediately procure such insurance as specified, the DISTRICT reserves the right to procure such insurance and to charge the cost thereof to CONTRACTOR.

- U. The CONTRACTOR's work is subject to terms and conditions of permits issued by the State, the County, and/or other local agencies.

Additional Terms

In addition to other provisions, including but not limited to those in the General Conditions the parties agree:

1. No action or failure to act by Owner, Engineer or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.
2. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the contract documents.
3. THE DISTRICT and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the contract documents.
4. Both the DISTRICT and CONTRACTOR have full power, authority and legal right to make this Contract and to incur and perform its obligations hereunder.
5. The making and performance by CONTRACTOR of this Agreement (1) have been duly authorized by all necessary action of CONTRACTOR and (2) do not and will not violate any provision of any applicable law, rule, regulation, or order of any court, regulatory commission, board, or other administrative agency and (3) do not and will not result in the breach of, or constitute a default or require consent under any other agreement or instrument to which CONTRACTOR is a party or by which CONTRACTOR may be bound or affected.
6. This Contract has been duly executed and delivered by CONTRACTOR and constitutes a legal, valid and binding obligation of CONTRACTOR, enforceable in accordance with its terms subject to the laws of bankruptcy, insolvency, or other similar laws affecting the enforcement of creditors' rights generally.
7. CONTRACTOR and the DISTRICT recognize that time is of the essence of this Agreement and that the DISTRICT will suffer financial loss if the work is not completed within the times specified in the Contract, plus any extensions thereof allowed in accordance with Section H of the General Conditions.
8. The parties certify that they have read and understood this Contract and agree to be bound by its terms, and agree that their representatives executing this Contract are authorized to do so on their behalf.

9. CONTRACTOR and subcontractors shall make and maintain for a period of six (6) years from the completion of work, records necessary to determine whether the prevailing rate of wage and overtime has been or is being paid to workers upon public works.
10. The DISTRICT standard contract provisions are incorporated by reference.
11. The DISTRICT shall pay the required prevailing wage fee to the Commissioner of the Bureau of Labor and Industries.

IN WITNESS WHEREOF, the parties have executed this contract on the below said date.

For the FERN RIDGE SCHOOL DISTRICT 28J:

Date: _____
Name: Dr. Sally Storm Title: Superintendent

For EXAMPLE CONSTRUCTION, INC.:

Date: _____
Name: _____ Title: _____

**APPENDIX A
INSURANCE COVERAGE REQUIRED**

Respondent shall not commence any work until Respondent obtains, at Respondent's own expense, all required insurance as specified below. Such insurance must have the approval of the District as to limits, form and amount and must include FERN RIDGE SCHOOL DISTRICT 28J as an insured party. The types of insurance Respondent is required to obtain or maintain for the full period of the contract will be:

COMPREHENSIVE COMMERCIAL GENERAL LIABILITY insurance including personal injury, bodily injury and property damage with limits as specified below. The insurance shall include:

COVERAGES	LIMITS
Explosion & Collapse	\$1,000,000 per occurrence
Underground Hazard	\$2,000,000 general aggregate
Products/Completed Operations	
Contractual Liability	

FORM

All policies must be of the occurrence form with combined single limit for bodily injury and property damage. Any deviation from this must be reviewed by the Project Manager. All claims-made forms must have tail coverage and the prior approval of Project Manager. Submit a complete copy of claims-made policies and endorsements with the certificate of insurance.

AUTOMOBILE LIABILITY insurance comprehensive form with limits as specified below. The coverage shall include owned, hired and non-owned automobiles and include FERN RIDGE SCHOOL DISTRICT 28J and its board and employees as additional insureds.

LIMITS:

- \$2,000,000 combined single limit per accident for bodily injury and property damage
- \$1,000,000 combined single limit per accident or occurrence
- \$2,000,000 all claimants per accident or occurrence (aggregate)

ADDITIONAL INSURED CLAUSE The general and auto liability insurance coverage's required for performance of this contract shall be endorsed to name FERN RIDGE SCHOOL DISTRICT 28J and its board, officers, agents and employees as additional insureds on any insurance policies required herein with respect to Respondent's activities being performed under the Contract. The additional insureds must be named as an additional insured by endorsement, and the policy must be endorsed to show cancellation notices to FERN RIDGE SCHOOL DISTRICT 28J. Coverage shall be primary and non-contributory with any other insurance and self-insurance.

WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY as statutorily required for persons performing work under this contract. Any subcontractors hired by Respondent shall also carry Workers' Compensation and Employers' Liability coverage.

LIMITS:

- \$1,000,000 employer's liability

Any questions concerning insurance and indemnity should be directed to the District.

**APPENDIX B
STANDARD CONTRACT PROVISIONS**

- A. The following standard public contract clauses shall be included expressly or by reference where appropriate in every contract of the District.
1. Contractor shall make payment promptly, as due, to all persons supplying to such contractor labor or material for the prosecution of the work provided for in the contract, and shall be responsible for payment to such persons supplying labor or material to any subcontractor.
 2. Contractor shall pay promptly all contributions or amounts due to the State Industrial Accident Fund and the State Unemployment Compensation Fund from contractor or any subcontractor in connection with the performance of the contract.
 3. Contractor shall not permit any lien or claim to be filed or prosecuted against the District on account of any labor or material furnished, shall assume responsibility for satisfaction of any lien so filed or prosecuted and shall defend against, indemnify and hold County harmless from any such lien or claim.
 4. Contractor and any subcontractor shall pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.
 5. For public improvement and construction contracts only, if contractor fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to the contractor or a subcontractor by any person in connection with the public contract as such claim becomes due, the District may pay such claim to the person furnishing the labor or services and charge the amount of the payment against funds due or to become due the contractor by reason of the contract. The payment of a claim in the manner authorized hereby shall not relieve the contractor or its surety from the obligation with respect to any unpaid claim. If the District is unable to determine the validity of any claim for labor or services furnished, the District may withhold from any current payment due contractor an amount equal to said claim until its validity is determined, and the claim, if valid, is paid by the contractor or the District. There shall be no final acceptance of the work under the contract until all such claims have been resolved.
 6. Contractor shall make payment promptly, as due, to any person, co-partnership, association or corporation furnishing medical, surgical, hospital or other needed care and attention, incident to sickness or injury, to the employees of contractor, of all sums which the contractor agreed to pay or collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing payment for such service.
 7. With certain exceptions listed below, contractor shall not require or permit any person to work more than 10 hours in any one day, or 40 hours in any one week except in case of necessity, emergency, or where public policy absolutely requires it, and in such cases the person shall be paid at least time and a half for:
 - a) All overtime in excess of eight hours a day or 40 hours in any one week when the work week is five consecutive days, Monday through Friday, or
 - b) All overtime in excess of 10 hours a day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday, and
 - c) All work performed on the days specified in ORS 279B.020 (1) for non-public improvement contracts or ORS 279C.540 (1) for public improvement contracts.
 - d) For personal/professional service contracts as designated under ORS 279A.055, instead of (a) and (b) above, a laborer shall be paid at least time and a half for all overtime worked in excess of 40 hours in any one week, except for individuals under these contracts who are

excluded under ORS 653.010 to 653.261 or under 29 U.S.C. Sections 201 to 209, from receiving overtime.

- e) Contractor shall follow all other exceptions, pursuant to ORS 279B.235 (for non-public improvement contracts) and ORS 279C.540 (for public improvement contracts), including contracts involving a collective bargaining agreement, contracts for services, and contracts for fire prevention or suppression. For contracts other than construction or public improvements, this subsection (7) does not apply to contracts for purchase of goods or personal property.
 - f) Contractor must give notice to employees who work on a public contract in writing, either at the time of hire or before commencement of work on the contract, or by posting a notice in a location frequented by employees, of the number of hours per day and days per week that the employees may be required to work.
8. The hourly rate of wage to be paid by any contractor or subcontractor to workers upon all public works shall be not less than the applicable prevailing rate of wage for an hour's work in the same trade or occupation in the locality where such labor is performed, in accordance with ORS 279C.800 to ORS 279C.850.
 9. The contractor, its subcontractors, if any, and all employers working under the contract are subject employers under the Oregon Workers' Compensation Law and shall comply with ORS 656.017, or otherwise be exempt under ORS 656.126.
 10. As to public improvement and construction contracts, Contractor shall comply with all applicable federal, state, and local laws and regulations, including but not limited to those dealing with the prevention of environmental pollution and the preservation of natural resources that affect the performance of the contract. A list of entities who have enacted such laws or regulations is found in the Oregon Attorney General's Model Public Contract Rules Manual, OAR 137-030-0010, Commentary 4. If new or amended statutes, ordinances, or regulations are adopted, or the contractor encounters a condition not referred to in the bid document not caused by the contractor and not discoverable by reasonable site inspection which requires compliance with federal, state, or local laws or regulations dealing with the prevention of environmental pollution or the preservation of natural resources, both the District and the contractor shall have all the rights and obligations specified in ORS 279C.525 to handle the situation.
 11. The contract may be canceled at the election of the District for any substantial breach, willful failure or refusal on the part of contractor to faithfully perform the contract according to its terms. The District may terminate the contract by written order or upon request of the contractor, if the work cannot be completed for reasons beyond the control of either the contractor or the District, or for any reason considered to be in the public interest other than a labor dispute, or by reason of any third party judicial proceeding relating to the work other than one filed in regards to a labor dispute, and when circumstances or conditions are such that it is impracticable within a reasonable time to proceed with a substantial portion of the work. In either case, for public improvement contracts, if the work is suspended but the contract not terminated, the contractor is entitled to a reasonable time extension, costs and overhead per ORS 279C.655. Unless otherwise stated in the contract, if the contract is terminated, the contractor shall be paid per ORS 279C.660 for a public improvement contract.
 12. If the District does not appropriate funds for the next succeeding fiscal year to continue payments otherwise required by the contract, the contract will terminate at the end of the last fiscal year for which payments have been appropriated. The District will notify the contractor of such non-appropriation not later than 30 days before the beginning of the year within which funds are not appropriated. Upon termination pursuant to this clause, the

District shall have no further obligation to the contractor for payments beyond the termination date. This provision does not permit the District to terminate the contract in order to provide similar services or goods from a different contractor.

13. By execution of this contract, contractor certifies, under penalty of perjury that:
 - a) To the best of contractor's knowledge, contractor is not in violation of any tax laws described in ORS 305.380(4), and
 - b) Contractor has not discriminated against minority, women or small business enterprises in obtaining any required subcontracts.
 - c) Contractor is in full compliance with all applicable state and federal laws and is not debarred under either state or federal regulations.
14. Contractor agrees to prefer goods or services that have been manufactured or produced in this State if price, fitness, availability or quality are otherwise equal.
15. Contractor agrees to not assign this contract or any payments due hereunder without the proposed assignee being first approved and accepted in writing by the District.
16. Contractor agrees to make all provisions of the contract with the District applicable to any subcontractor performing work under the contract.
17. The District will not be responsible for any losses or unanticipated costs suffered by contractor as a result of the contractor's failure to obtain full information in advance in regard to all conditions pertaining to the work.
18. All modifications and amendments to the contract shall be effective only if in writing and executed by both parties.
19. The contractor certifies he or she has all necessary licenses, permits, or certificates of registration (including Construction Contractors Board registration or Landscape Contractors Board license, if applicable), necessary to perform the contract and further certifies that all subcontractors shall likewise have all necessary licenses, permits or certificates before performing any work. The failure of contractor to have or maintain such licenses, permits, or certificates is grounds for rejection of a bid or immediate termination of the contract.
20. Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin in hiring and Contractor will further not discriminate against any employee during employment of any person because of race, color, religion, sex, or national origin. Contractor will send notice of this non-discrimination policy to any labor union or representative of workers, and shall post in conspicuous places notices setting forth the provisions of this on discrimination clause.
21. The Oregon Standard Specifications for Construction adopted by the State of Oregon, and the Manual on Uniform Traffic Control Devices, each as is currently in effect, shall be applicable to all road construction projects.
22. When a public contract is awarded to a nonresident bidder and the contract price exceeds \$10,000, the contractor shall promptly report to the Department of Revenue on forms to be provided by the department the total contract price, terms of payment, length of contract and such other information as the department may require before the DISTRICT will make final payment on the contract.

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GENERAL CONDITIONS

SECTION A GENERAL PROVISIONS

A.1 DEFINITION OF TERMS

In the Contract Documents the following terms shall be as defined below:

ARCHITECT/ENGINEER, means the Person appointed by the Owner to make drawings and specifications and, to provide contract administration of the Work contemplated by the Contract to the extent provided herein or by supplemental instruction of Owner (under which Owner may delegate responsibilities of the Owner's Authorized Representative to the Architect/Engineer), in accordance with ORS Chapter 671 (Architects) or ORS Chapter 672 (Engineers).

CHANGE ORDER, means a written order issued by the Owner's Authorized Representative to the Contractor requiring a change in the Work within the general scope of the Contract Documents, issued under the changes provisions of Section D.1 in administering the Contract, including Owner's written change directives as well as changes reflected in a writing executed by the parties to this Contract and, if applicable, establishing a Contract Price or Contract Time adjustment for the changed Work.

CLAIM, means a demand or assertion by Contractor seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of Contract Time or other relief pursuant to Section D.3.

CONTRACT, means the written agreement between the Owner and the Contractor comprised of the Contract Documents which describe the Work to be done and the obligations between the parties.

CONTRACT DOCUMENTS, means the Solicitation Document and addenda thereto, the Agreement Form, General Conditions, Supplemental General Conditions, if any, the accepted Offer, Plans, Specifications, amendments and Change Orders.

CONTRACT PERIOD, as set forth in the Contract Documents, means the total period of time beginning with the issuance of the Notice to Proceed and concluding upon Final Completion.

CONTRACT PRICE, means the total of the awarded Offer amount, as increased or decreased by the price of approved alternates and Change Orders.

CONTRACT TIME, means any incremental period of time allowed under the Contract to complete any portion of the Work as reflected in the project schedule.

CONTRACTOR, means the Person awarded the Contract for the Work contemplated.

DAYS, are calendar days, including weekdays, weekends and holidays, unless otherwise specified.

DIRECT COSTS, means, unless otherwise provided in the Contract Documents, the cost of materials, including sales tax, cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits required by agreement or custom; worker's compensation insurance; project specific insurance; bond premiums, rental cost of equipment, and machinery required for execution of the work; and the additional costs of field personnel directly attributable to the Work.

FINAL COMPLETION, means the final completion of all requirements under the Contract, including Contract Closeout as described in Section K but excluding Warranty Work as described in Section I.2, and the final payment and release of all retainage, if any, released.

FORCE MAJEURE, means an act, event or occurrence caused by fire, riot, war, acts of God, nature, sovereign, or public enemy, strikes, freight embargoes or any other act, event or occurrence that is beyond the control of the party to this Contract who is asserting Force Majeure.

MILESTONE, means a scheduled event that establishes the completion of a major deliverable element of a project. A milestone is measurable, observable and serves as a progress marker. Milestones must be included in the project's approved schedule and will not change without written approval by owner.

NOTICE TO PROCEED, means the official written notice from the Owner stating that the Contractor is to proceed with the Work defined in the Contract Documents. Notwithstanding the Notice to Proceed, Contractor shall not be authorized to proceed with the Work until all initial Contract requirements, including the Contract, performance bond and payment bond, and certificates of insurance, have

been fully executed and submitted to Owner in a suitable form.

OFFER, means a bid in connection with an invitation to bid and a proposal in connection with a request for proposals.

OFFEROR, means a bidder in connection with an invitation to bid and a proposer in connection with a request for proposals.

OVERHEAD, means those items which may be included in the Contractor's markup (general and administrative expense and profit) but shall not include items such as wages or salary of personnel working at the job site (including supervisory personnel above the level of foreman such as superintendents and project managers stationed at the job site), expenses of the Contractor's temporary job site office (including personnel staffing that office), or other items that are charged as Direct Cost of the Work.

OWNER, means Fern Ridge School District 28J.

OWNER'S AUTHORIZED REPRESENTATIVE, means those individuals identified in writing by the Owner to act on behalf of the Owner for this project. Owner may elect, by written notice to Contractor, to delegate certain duties of the Owner's Authorized Representative to more than one party, including without limitation, to an Architect/Engineer. However, nothing in these General Conditions is intended to abrogate the separate design professional responsibilities of Architects under ORS Chapter 671 or of Engineers under ORS Chapter 672.

PERSON, means an entity doing business as a sole proprietorship, a partnership, a joint venture, a corporation, a limited liability company or partnership, or any other entity possessing the legal capacity to contract.

PLANS, means the drawings which show the location, type, dimensions, and details of the Work to be done under the Contract.

PUNCHLIST, means the list of Work yet to be completed or deficiencies which need to be corrected in order to achieve Final Completion of the Contract.

RECORD DOCUMENT, means the as-built Plans, Specifications, testing and inspection records, product data, samples, manufacturer and distributor/supplier warranties evidencing transfer to Owner, operational and maintenance manuals, shop drawings, Change Orders, correspondence, certificate(s) of occupancy, and other documents listed in Subsection B.9.1 of these General Conditions, recording all Services performed.

SOLICITATION DOCUMENT, means an invitation to bid or request for proposal or request for quotes.

SPECIFICATION, means any description of the physical or functional characteristics of the Work, or of the nature of

a supply, service or construction item. Specifications may include a description of any requirement for inspecting, testing or preparing a supply, service or construction item for delivery and the quantities or qualities of materials to be furnished under the Contract. Specifications generally will state the results or products to be obtained and may, on occasion, describe the method and manner of doing the work to be performed. Specifications may be incorporated by reference and/or may be attached to the Contract.

SUBCONTRACTOR, means a Person having a direct contract with the Contractor, or another Subcontractor, to perform one or more items of the Work.

SUBSTANTIAL COMPLETION, means the date when the Owner accepts in writing the construction, alteration or repair of the improvement to real property or any designated portion thereof as having reached that state of completion when it may be used or occupied for its intended purpose. Substantial Completion of facilities with operating systems occurs only after thirty (30) continuous Days of successful, trouble-free operation of the operating systems as provided in Section K.4.2.

SUBSTITUTIONS, means items that in function, performance, reliability, quality, and general configuration are the same or better than the product(s) specified. Approval of any substitute item shall be solely determined by the Owner's Authorized Representative. The decision of the Owner's Authorized Representative is final.

SUPPLEMENTAL GENERAL CONDITIONS, means those conditions that remove from, add to, or modify these General Conditions. Supplemental General Conditions may be included in the Solicitation Document or may be a separate attachment to the Contract.

WORK, means the furnishing of all materials, equipment, labor, transportation, services and incidentals necessary to successfully complete any individual item or the entire Contract and the carrying out of duties and obligations imposed by the Contract Documents.

A.2 SCOPE OF WORK

The Work contemplated under this Contract includes all labor, materials, transportation, equipment and services, for, and incidental to, the completion of all construction work in connection with the project described in the Contract Documents. The Contractor shall perform all Work necessary so that the project can be legally occupied and fully used for the intended use as set forth in the Contract Documents.

A.3 INTERPRETATION OF CONTRACT DOCUMENTS

A.3.1 Unless otherwise specifically defined in the Contract Documents, words which have well-known technical meanings or construction industry meanings are used in the Contract Documents in accordance with such recognized

meanings. Contract Documents are intended to be complementary. Whatever is called for in one, is interpreted to be called for in all. However, in the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following descending order of precedence:

1. Contract amendments and Change Orders, with those of later date having precedence over those of an earlier date;
2. The Supplemental General Conditions;
3. The Agreement Form;
4. The General Conditions
5. The Plans and Specifications
6. The Solicitation Document and any addenda thereto;
7. The accepted Offer.

A.3.2 In the case of an inconsistency between Plans and Specifications or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Owner or Owner's Authorized Representative's interpretation in writing.

A.3.3 If the Contractor finds discrepancies in, or omissions from the Contract Documents, or if the Contractor is in doubt as to their meaning, the Contractor shall at once notify the Owner or Owner's Authorized Representative. Matters concerning performance under, and interpretation of requirements of, the Contract Documents will be decided by the Owner's Authorized Representative, who may delegate that duty in some instances to the Architect/Engineer. Responses to Contractor's requests for interpretation of Contract Documents will be made in writing by Owner's Authorized Representative (or the Architect/Engineer) within any time limits agreed upon or otherwise with reasonable promptness. Interpretations and decisions of the Owner's Authorized Representative (or Architect/Engineer) will be consistent with the intent of and reasonably inferable from the Contract Documents. Contractor shall not proceed without direction in writing from the Owner's Authorized Representative (or Architect/Engineer).

A.3.4 References to standard specifications, manuals, codes of any technical society, organization or association, to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, laws or regulations in effect in the jurisdiction where the project is occurring on the first published date of the Solicitation Document, except as may be otherwise specifically stated.

A.4 EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE

A.4.1 It is understood that the Contractor, before submitting an Offer, has made a careful examination of the Contract Documents; has become fully informed as to the quality and quantity of materials and the character of the Work required; and has made a careful examination of the location and conditions of the Work and the sources of supply for materials. The Owner will in no case be responsible for any loss or for any unanticipated costs that may be suffered by the Contractor as a result of the Contractor's failure to acquire full information in advance in regard to all conditions pertaining to the Work. No oral agreement or conversation with any officer, agent, or personnel of the Owner, or with the Architect/Engineer either before or after the execution of this Contract, shall affect or modify any of the terms or obligations herein contained.

A.4.2 Should the Plans or Specifications fail to particularly describe the materials, kind of goods, or details of construction of any aspect of the Work, Contractor shall have the duty to make inquiry of the Owner and Architect/Engineer as to what is required prior to performance of the Work. Absent Specifications to the contrary, the materials or processes that would normally be used to produce first quality finished Work shall be considered a part of the Contract requirements.

A.4.3 Any design errors or omissions noted by the Contractor shall be reported promptly to the Owner's Authorized Representative, including without limitation, any nonconformity with applicable laws, statutes, ordinances, building codes, rules and regulations.

A.4.4 If the Contractor believes that additional cost or Contract Time is involved because of clarifications or instructions issued by the Owner's Authorized Representative (or Architect/Engineer) in response to the Contractor's notices or requests for information, the Contractor must submit a written request to the Owner's Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt by Contractor of the clarifications or instructions issued. If the Contractor does not concur with the decision of the Owner's Authorized Representative regarding time and cost impacts of the clarifications or instructions, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process. If the Contractor fails to perform the obligations of Sections A.4.1 to A.4.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations.

A.5 INDEPENDENT CONTRACTOR STATUS

The service or services to be performed under this Contract are those of an independent contractor. Contractor represents and warrants that it is not an officer, employee

or agent of the Owner as those terms are used in ORS 30.265.

A.6 RETIREMENT SYSTEM STATUS AND TAXES

Contractor represents and warrants that it is not a contributing member of the Public Employees' Retirement System and will be responsible for any federal or state taxes applicable to payment received under this Contract. Contractor will not be eligible for any benefits from these Contract payments of federal Social Security, employment insurance, workers' compensation or the Public Employees' Retirement System, except as a self-employed individual. Unless the Contractor is subject to backup withholding, Owner will not withhold from such payments any amount(s) to cover Contractor's federal or state tax obligations.

A.7 GOVERNMENT EMPLOYMENT STATUS

A.7.1 If this payment is to be charged against federal funds, Contractor represents and warrants that it is not currently employed by the Federal Government. This does not preclude the Contractor from holding another contract with the Federal Government.

A.7.2 Contractor represents and warrants that Contractor is not an employee of Fern Ridge School District 28J for purposes of performing Work under this Contract.

SECTION B **ADMINISTRATION OF THE CONTRACT**

B.1 OWNER'S ADMINISTRATION OF THE CONTRACT

B.1.1 The Owner's Authorized Representative will provide administration of the Contract as described in the Contract Documents (1) during construction (2) until final payment is due and (3) during the one-year period for correction of Work. The Owner's Authorized Representative will act on behalf of the Owner to the extent provided in the Contract Documents, unless modified in writing in accordance with other provisions of the Contract. In performing these tasks, the Owner's Authorized Representative may rely on the Architect/Engineer or other consultants to perform some or all of these tasks.

B.1.2 The Owner's Authorized Representative will visit the site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, and (3) to determine in general if Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. The Owner's Authorized Representative will not make exhaustive or continuous on-site inspections to

check the quality or quantity of the Work. The Owner's Authorized Representative will neither have control over or charge of, nor be responsible for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work.

B.1.3 Except as otherwise provided in the Contract Documents or when direct communications have been specifically authorized, the Owner and Contractor shall endeavor to communicate with each other through the Owner's Authorized Representative or designee about matters arising out of or relating to the Contract. Communications by and with the Architect/Engineer's consultants shall be through the Architect/Engineer. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner's Authorized Representative.

B.1.4 Based upon the Architect/Engineer's evaluations of the Contractor's Application for Payment, or unless otherwise stipulated by the Owner's Authorized Representative, the Architect/Engineer will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

B.2 CONTRACTOR'S MEANS AND METHODS; MITIGATION OF IMPACTS

B.2.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures.

B.2.2 The Contractor is responsible to protect and maintain the Work during the course of construction and to mitigate any adverse impacts to the project, including those caused by authorized changes, which may affect cost, schedule, or quality.

B.2.3 The Contractor is responsible for the actions of all its personnel, laborers, suppliers, and Subcontractors on the project. The Contractor shall enforce strict discipline and good order among Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of persons who are unfit or unskilled for the tasks assigned to them.

B.3 MATERIALS AND WORKMANSHIP

B.3.1 The intent of the Contract Documents is to provide for the construction and completion in every detail of the Work described. All Work shall be performed in a professional manner and unless the means or methods of performing a task are specified elsewhere in the Contract Documents, Contractor shall employ methods that are generally accepted and used by the industry, in accordance with industry standards.

B.3.2 The Contractor is responsible to perform the Work as required by the Contract Documents. Defective Work shall be corrected at the Contractor's expense.

B.3.3 Work done and materials furnished shall be subject to inspection and/or observation and testing by the Owner's Authorized Representative to determine if they conform to the Contract Documents. Inspection of the Work by the Owner's Authorized Representative does not relieve the Contractor of responsibility for the Work in accordance with the Contract Documents.

B.3.4 Contractor shall furnish adequate facilities, as required, for the Owner's Authorized Representative to have safe access to the Work including without limitation walkways, railings, ladders, tunnels, and platforms. Producers, suppliers, and fabricators shall also provide proper facilities and access to their facilities.

B.3.5 The Contractor shall furnish Samples of materials for testing by the Owner's Authorized Representative and include the cost of the Samples in the Contract Price.

B.4 PERMITS

Contractor shall obtain and pay for all necessary permits and licenses, except for those specifically excluded in B.4.1. below or in the Supplemental General Conditions, for the construction of the Work, for temporary obstructions, enclosures, opening of streets for pipes, walls, utilities, environmental Work, etc., as required for the project. Contractor shall be responsible for all violations of the law, in connection with the construction or caused by obstructing streets, sidewalks or otherwise. Contractor shall give all requisite notices to public authorities. The Contractor shall pay all royalties and license fees. The Contractor shall defend all suits or claims for infringement of any patent or other proprietary rights and save harmless and blameless from loss, on account thereof, the Fern Ridge School District 28J, and its board, departments,, employees, and volunteers.

B.4.1 The Owner will pay for the following permits. All others are the responsibility of the Contractor:

1. Building, Site, and Safety Plan Check Fee
2. Fire Department Plan Check Fee
3. Building Permit Fee
4. DEQ 1200-C Permit

5. State, Zone, and Seismic, Surcharge Fees

5. System Development Fees

B.5 COMPLIANCE WITH GOVERNMENT LAWS AND REGULATIONS

B.5.1 Contractor shall comply with all federal, state and local laws, codes, regulations and ordinances applicable to the Work and the Contract. Failure to comply with such requirements shall constitute a breach of Contract and shall be grounds for Contract termination. Without limiting the generality of the foregoing, Contractor expressly agrees to comply with the following as applicable: i) Title VI and VII of Civil Rights Act of 1964, as amended; (ii) Section 503 and 504 of the Rehabilitation Act of 1973, as amended; (iii) the Health Insurance Portability and Accountability Act of 1996; (iv) the Americans with Disabilities Act of 1990, as amended; (v) ORS Chapter 659A; as amended (vi) all regulations and administrative rules established pursuant to the foregoing laws; and (vii) all other applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations. Owner's performance under the Contract is conditioned upon Contractor's compliance with the provisions of ORS 279C.505, 279C.510, 279C.515, 279C.520, and 279C.530, which are incorporated by reference herein.

B.5.2 Contractor shall comply with all applicable requirements of federal and state civil rights and rehabilitation statutes, rules and regulations; and

(a) Contractor shall not discriminate against Disadvantaged, Minority, Women or Emerging Small Business enterprises, as those terms are defined in ORS 200.005, in the awarding of subcontracts (ORS 279A.110).

(b) Contractor shall maintain, in current and valid form, all licenses and certificates required by law, regulation, or this Contract when performing the Work.

B.5.3 Unless contrary to federal law, Contractor shall certify that it shall not accept a bid from Subcontractors to perform Work as described in ORS 701.005 under this Contract unless such Subcontractors are registered with the Construction Contractors Board in accordance with ORS 701.035 to 701.055 at the time they submit their bids to the Contractor.

B.5.4 Unless contrary to federal law, Contractor shall certify that each landscape contractor, as defined in ORS 671.520(2), performing Work under this Contract holds a valid landscape contractor's license issued pursuant to ORS 671.560.

B.5.5 The following notice is applicable to Contractors who perform excavation Work. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon

Utility Notification Center. Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the center at (503)232-1987.

B.5.6 Failure to comply with any or all of the requirements of B.5.1 through B.5.5 shall be a breach of Contract and constitute grounds for Contract termination. Damages or costs resulting from such noncompliance shall be the responsibility of Contractor.

B.6 SUPERINTENDENCE

Unless stated otherwise in the Contract Documents, the Contractor shall keep on the site, during the progress of the Work, a competent superintendent and any necessary assistants who shall be satisfactory to the Owner and who shall represent the Contractor on the site. Directions given to the superintendent by the Owner's Authorized Representative shall be confirmed in writing to the Contractor.

B.7 INSPECTION

B.7.1 Owner's Authorized Representative shall have access to the Work at all times.

B.7.2 Inspection of the Work will be made by the Owner's Authorized Representative at its discretion. The Owner's Authorized Representative will have authority to reject Work that does not conform to the Contract Documents. Any Work found to be not in conformance with the Contract Documents, in the discretion of the Owner's Authorized Representative, shall be removed and replaced at the Contractor's expense.

B.7.3 Contractor shall make or obtain at the appropriate time all tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work. The Contractor shall give the Owner's Authorized Representative timely notice of when and where tests and inspections are to be made so that the Owner's Authorized Representative may be present for such procedures. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Owner's Authorized Representative.

B.7.4 As required by the Contract Documents, Work done or material used without inspection or testing by the

Owner's Authorized Representative may be ordered removed at the Contractor's expense.

B.7.5 If directed to do so any time before the Work is accepted, the Contractor shall uncover portions of the completed Work for inspection. After inspection, the Contractor shall restore such portions of Work to the standard required by the Contract. If the Work uncovered is unacceptable or was done without sufficient notice to the Owner's Authorized Representative, the uncovering and restoration shall be done at the Contractor's expense. If the Work uncovered is acceptable and was done with sufficient notice to the Owner's Authorized Representative, the uncovering and restoration will be paid for as a Change Order.

B.7.6 If any testing or inspection reveals failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Owner's Authorized Representative's and Architect/Engineer's services and expenses, shall be at the Contractor's expense.

B.7.7 When the United States government participates in the cost of the Work, or the Owner has an agreement with other public or private organizations, or if any portion of the Work is being performed for a third party or in close proximity to third party facilities, representatives of these organizations have the right to inspect the Work affecting their interests or property. Their right to inspect shall not make them a party to the Contract and shall not interfere with the rights of the parties of the Contract. Instructions or orders of such parties shall be transmitted to the Contractor, through the Owner's Authorized Representative.

B.8 SEVERABILITY

If any provision of this Contract is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected and the rights and obligations of the parties shall be construed and enforced as if the Contract did not contain the particular provision held to be invalid.

B.9 ACCESS TO RECORDS

B.9.1 Contractor shall keep, at all times on the Work site, one record copy of the complete Contract Documents, including the Plans, Specifications, Change Orders and addenda, in good order and marked currently to record field changes and selections made during construction, and one record copy of Shop Drawings, Product Data, Samples and similar submittals, and shall at all times give the Owner's Authorized Representative access thereto.

B.9.2 Contractor shall retain and the Owner and its duly authorized representatives shall have access to, for a period not less than six (6) years, all Record Documents, financial and accounting records, and other books, documents,

papers and records of Contractor which are pertinent to the Contract including records pertaining to Overhead and indirect costs, for the purpose of making audit, examination, excerpts and transcripts. If for any reason, any part of the Contract is involved in litigation, Contractor shall retain all such records until all litigation is resolved. The Owner and/or its agents shall continue to be provided full access to the records during litigation.

B.10 WAIVER

Failure of the Owner to enforce any provision of this Contract shall not constitute a waiver or relinquishment by the Owner of the right to such performance in the future nor of the right to enforce any other provision of this Contract.

B.11 SUBCONTRACTS AND ASSIGNMENT

B.11.1 Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound by the terms and conditions of these General Conditions, and to assume toward the Contractor all of the obligations and responsibilities which the Contractor assumes toward the Owner thereunder, unless (1) the same are clearly inapplicable to the subcontract at issue because of legal requirements or industry practices, or (2) specific exceptions are requested by Contractor and approved in writing by Owner. Where appropriate, Contractor shall require each Subcontractor to enter into similar agreements with sub-subcontractors at any level.

B.11.2 At Owner's request, Contractor shall submit to Owner prior to their execution either Contractor's form of subcontract, or the subcontract to be executed with any particular Subcontractor. If Owner disapproves such form, Contractor shall not execute the form until the matters disapproved are resolved to Owner's satisfaction. Owner's review, comment upon or approval of any such form shall not relieve Contractor of its obligations under this Agreement or be deemed a waiver of such obligations of Contractor.

B.11.3 Contractor shall not assign, sell, or transfer its rights, or delegate its responsibilities under this Contract, in whole or in part, without the prior written approval of the Owner. No such written approval shall relieve Contractor of any obligations of this Contract, and any transferee shall be considered the agent of the Contractor and bound to perform in accordance with the Contract Documents. Contractor shall remain liable as between the original parties to the Contract as if no assignment had occurred.

B.12 SUCCESSORS IN INTEREST

The provisions of this Contract shall be binding upon and shall accrue to the benefit of the parties to the Contract and their respective permitted successors and assigns.

B.13 OWNER'S RIGHT TO DO WORK

Owner reserves the right to perform other or additional work at or near the project site with other forces than those of the Contractor. If such work takes place within or next to the project site, Contractor will coordinate work with the other contractors or forces, cooperate with all other contractors or forces, carry out the Work in a way that will minimize interference and delay for all forces involved, place and dispose of materials being used so as not to interfere with the operations of another, and join the Work with the work of the others in an acceptable manner and perform it in proper sequence to that of the others. The Owner's Authorized Representative will resolve any disagreements that may arise between or among Contractor and the other contractors over the method or order of doing all work (including the Work). In case of unavoidable interference, the Owner's Authorized Representative will establish work priority (including the Work) which generally will be in the sequence that the contracts were awarded.

B.14 OTHER CONTRACTS

In all cases and at any time, the Owner has the right to execute other contracts related to or unrelated to the Work of this Contract. The Contractor of this Contract will fully cooperate with any and all other contractors without additional cost to the Owner in the manner described in Section B.13.

B.15 GOVERNING LAW

This Contract shall be governed by and construed in accordance with the laws of the State of Oregon without regard to principles of conflict of laws.

B.16 LITIGATION

Any Claim between Owner and Contractor that arises from or relates to this Contract and that is not resolved through the Claims Review Process in Section D.3 shall be brought and conducted solely and exclusively within the Circuit Court of Lane County for the State of Oregon; provided, however, if a Claim must be brought in a federal forum, then it shall be brought and conducted solely and exclusively within the United States District Court for the District of Oregon. In no event shall this section be construed as a waiver by Fern Ridge School District 28J on any form of defense or immunity, whether sovereign immunity, governmental immunity, immunity based on the Eleventh Amendment to the Constitution of the United States or otherwise, from any claim or from the jurisdiction of any court. CONTRACTOR BY EXECUTION OF THIS CONTRACT HEREBY CONSENTS TO THE IN PERSONAM JURISDICTION OF THE COURTS REFERENCED IN THIS SECTION B.16.

B.17 ALLOWANCES

B.17.1 The Contractor shall include in the Contract Price all allowances stated in the Contract Documents. Items

covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct.

B.17.2 Unless otherwise provided in the Contract Documents:

(a) When finally reconciled, allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

(b) Contractor's costs for unloading and handling at the site, labor, installation costs, Overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Price but not in the allowances;

(c) Whenever costs are more than or less than allowances, the Contract Price shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (i) the difference between actual costs and the allowances under Section B.17.2(a) and (2) changes in Contractor's costs under Section B.17.2(b).

(d) Unless Owner requests otherwise, Contractor shall provide to Owner a proposed fixed price for any allowance work prior to its performance.

B.18 SUBMITTALS, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

B.18.1 The Contractor shall prepare and keep current, for the Architect's/Engineer's approval (or for the approval of Owner's Authorized Representative if approval authority has not been delegated to the Architect/Engineer), a schedule and list of submittals which is coordinated with the Contractor's construction schedule and allows the Architect/Engineer reasonable time to review submittals. Owner reserves the right to finally approve the schedule and list of submittals. Submittals include, without limitation, Shop Drawings, Product Data, and Samples which are described below:

(a) Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor (including any sub-subcontractor), manufacturer, supplier or distributor to illustrate some portion of the Work.

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

(c) Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

B.18.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract

Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review of submittals by the Architect/Engineer is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, or for approval of safety precautions or, unless otherwise specifically stated by the Architect/Engineer, of any construction means, methods, techniques, sequences or procedures, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect/Engineer's review of the Contractor's submittals shall not relieve the Contractor of its obligations under the Contract Documents. The Architect/Engineer's approval of a specific item shall not indicate approval of an assembly of which the item is a component. Informational submittals upon which the Architect/Engineer is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect/Engineer without action.

B.18.3 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect/Engineer Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect/Engineer without action.

B.18.4 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

B.18.5 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect/Engineer.

B.18.6 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect/Engineer's review or approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect/Engineer in writing of such deviation at the time of submittal and (i) the Architect/Engineer has given written approval to the

specific deviation as a minor change in the Work, or (ii) a Change Order has been executed by Owner authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect/Engineer's review or approval thereof.

B.18.7 In the event that Owner elects not to have the obligations and duties described under this Section B.18 performed by the Architect/Engineer, or in the event no Architect/Engineer is employed by Owner on the project, all obligations and duties assigned to the Architect/Engineer hereunder shall be performed by the Owner's Authorized Representative.

B.19 SUBSTITUTIONS

The Contractor may make Substitutions only with the consent of the Owner, after evaluation by the Owner's Authorized Representative and only in accordance with a Change Order. Substitutions shall be subject to the requirements of the bid documents. By making requests for Substitutions, the Contractor represents that the Contractor has personally investigated the proposed substitute product; represents that the Contractor will provide the same warranty for the Substitution that the Contractor would for the product originally specified unless approved otherwise; certifies that the cost data presented is complete and includes all related costs under this Contract including redesign costs, and waives all claims for additional costs related to the Substitution which subsequently become apparent; and will coordinate the installation of the accepted Substitution, making such changes as may be required for the Work to be completed in all respects.

B.20 USE OF PLANS AND SPECIFICATIONS

Plans, Specifications and related Contract Documents furnished to Contractor by Owner or Owner's Architect/Engineer shall be used solely for the performance of the Work under this Contract. Contractor and its Subcontractors and suppliers are authorized to use and reproduce applicable portions of such documents appropriate to the execution of the Work, but shall not claim any ownership or other interest in them beyond the scope of this Contract, and no such interest shall attach. Unless otherwise indicated, all common law, statutory and other reserved rights, in addition to copyrights, are retained by Owner.

B.21 FUNDS AVAILABLE AND AUTHORIZED

Owner reasonably believes at the time of entering into this Contract that sufficient funds are available and authorized for expenditure to finance the cost of this Contract within the Owner's appropriation or limitation. Contractor understands and agrees that, to the extent that sufficient funds are not available and authorized for expenditure to finance the cost of this Contract, Owner's payment of amounts under this Contract attributable to Services

performed after the last day of the current biennium is contingent on Owner receiving from the Oregon Legislative Assembly appropriations, limitations or other expenditure authority sufficient to allow Owner, in the exercise of its reasonable administrative discretion, to continue to make payments under this Contract.

B.22 NO THIRD PARTY BENEFICIARIES

Owner and Contractor are the only parties to this Contract and are the only parties entitled to enforce its terms. Nothing in this Contract gives, is intended to give, or shall be construed to give or provide any benefit or right, whether directly, indirectly, or otherwise, to third persons unless such third persons are individually identified by name herein and expressly described as intended beneficiaries of the terms of this Contract.

SECTION C **WAGES AND LABOR**

C.1 MINIMUM WAGE RATES ON PUBLIC WORKS

Contractor shall comply fully with the provisions of ORS 279C.800 through 279C.870. Documents establishing those conditions, as determined by the Commissioner of the Bureau of Labor and Industries (BOLI), are included as attachments to the Contract Documents.

C.2 PAYROLL CERTIFICATION AND FEE REQUIREMENTS

C.2.1 In accordance with ORS 279C.845, the Contractor and every Subcontractor shall submit written certified statements to the Owner's Authorized Representative, on the form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying the hourly rate of wage paid each worker which the Contractor or the Subcontractor has employed on the project and further certifying that no worker employed on the project has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract, which certificate and statement shall be verified by the oath of the Contractor or the Subcontractor that the Contractor or Subcontractor has read such statement and certificate and knows the contents thereof and that the same is true to the Contractor or Subcontractor's best knowledge and belief. The certified statements shall set out accurately and completely the payroll records for the prior week including the name and address of each worker, the worker's correct classification, rate of pay, daily and weekly number of hours worked, deductions made and actual wages paid. Certified statements for each week during which the Contractor or Subcontractor has employed a worker on the project shall be submitted once a month, by the fifth business day of the following month.

The Contractor and Subcontractors shall preserve the certified statements for a period of six (6) years from the date of completion of the Contract.

C.3 PROMPT PAYMENT AND CONTRACT CONDITIONS

C.3.1 Pursuant to ORS 279C.505 and as a condition to Owner's performance hereunder, the Contractor shall:

C.3.1.1 Make payment promptly, as due, to all persons supplying to Contractor labor or materials for the prosecution of the Work provided for in this Contract.

C.3.1.2 Pay all contributions or amounts due the State Industrial Accident Fund from such Contractor or Subcontractor incurred in the performance of the Contract.

C.3.1.3 Not permit any lien or claim to be filed or prosecuted against the Owner on account of any labor or material furnished. Contractor will not assign any claims that Contractor has against Owner, or assign any sums due by Owner, to Subcontractors, suppliers, or manufacturers, and will not make any agreement or act in any way to give Subcontractors a claim or standing to make a claim against the Owner.

C.3.1.4 Pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

C.3.1.5 Demonstrate that an employee drug testing program is in place as follows:

(a) Contractor represents and warrants that Contractor has in place at the time of the execution of this Contract, and shall maintain during the term of this Contract, a Qualifying Employee Drug Testing Program for its employees that includes, at a minimum, the following:

- (1) A written employee drug testing policy,
- (2) Required drug testing for all new Subject Employees or, alternatively, required testing of all Subject Employees every 12 months on a random selection basis, and
- (3) Required testing of a Subject Employee when the Contractor has reasonable cause to believe the Subject Employee is under the influence of drugs.

A drug testing program that meets the above requirements will be deemed a "Qualifying Employee Drug Testing Program." For the purposes of this section, an employee is a "Subject Employee" only if that employee will be working on the project job site.

(b) Contractor shall require each Subcontractor providing labor for the project to:

(1) Demonstrate to the Contractor that it has a Qualifying Employee Drug Testing Program for the Subcontractor's

Subject Employees, and represent and warrant to the Contractor that the Qualifying Employee Drug Testing Program is in place at the time of subcontract execution and will continue in full force and effect for the duration of the subcontract, or

(2) Require that the Subcontractor's Subject Employees participate in the Contractor's Qualifying Employee Drug Testing Program for the duration of the subcontract.

C.3.2 Pursuant to ORS 279C.515, and as a condition to Owner's performance hereunder, Contractor agrees:

C.3.2.1 If Contractor fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to the Contractor or a Subcontractor by any person in connection with the project as such claim becomes due, the proper officer(s) representing the Owner may pay the claim and charge the amount of the payment against funds due or to become due Contractor under this Contract. Payment of claims in this manner shall not relieve the Contractor or the Contractor's surety from obligation with respect to any unpaid claims.

C.3.2.2 If the Contractor or a first-tier Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the public contract for a public improvement within thirty (30) Days after receipt of payment from Owner or a contractor, the contractor or first-tier Subcontractor shall owe the person the amount due plus interest charges commencing at the end of the 10-Day period that payment is due under ORS 279C.580(3) and ending upon final payment, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest charged to the Contractor or first-tier Subcontractor on the amount due shall equal three times the discount rate on 90-Day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is thirty (30) Days after the date when payment was received from Owner or from the Contractor, but the rate of interest shall not exceed thirty (30) percent. The amount of interest may not be waived.

C.3.2.3 If the Contractor or a Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the Contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580. Every contract related to this Contract shall contain a similar clause.

C.3.3 Pursuant to ORS 279C.580, Contractor shall include in each subcontract for property or services entered into by the Contractor and a first-tier Subcontractor, including a material supplier, for the purpose of performing a construction contract:

(a) A payment clause that obligates the Contractor to pay the first-tier Subcontractor for satisfactory performance under its subcontract within ten (10) Days out of such

amounts as are paid to the Contractor by Owner under the Contract;

(b) An interest penalty clause that obligates the Contractor if payment is not made within thirty (30) Days after receipt of payment from Owner, to pay to the first-tier Subcontractor an interest penalty on amounts due in the case of each payment not made in accordance with the payment clause included in the subcontract pursuant to paragraph (a) of this subsection. Contractor or first-tier Subcontractor shall not be obligated to pay an interest penalty if the only reason that the Contractor or first-tier Subcontractor did not make payment when payment was due is that the Contractor or first-tier Subcontractor did not receive payment from Owner or Contractor when payment was due. The interest penalty shall be for the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; and shall be computed at the rate specified in ORS 279C.515(2).

(c) A clause which requires each of Contractor's Subcontractor's to include, in each of their contracts with lower-tier Subcontractors or suppliers, provisions to the effect that the first-tier Subcontractor shall pay its lower-tier Subcontractors and suppliers in accordance with the provisions of subsections (a) and (b), above and requiring each of their Subcontractors and suppliers to include such clauses in their subcontracts and supply contracts.

C.3.4 All employers, including Contractor, that employ subject workers who work under this contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. Contractor shall ensure that each of its Subcontractors complies with these requirements.

C.4 PAYMENT FOR MEDICAL CARE

Pursuant to ORS 279C.530, and as a condition to Owner's performance hereunder, Contractor shall promptly, as due, make payment to any person, partnership, association or corporation furnishing medical, surgical, and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such Contractor, all sums of which the Contractor agrees to pay for such services and all moneys and sums which the Contractor has collected or deducted from the wages of personnel pursuant to any law, contract or agreement for the purpose of providing or paying for such services.

C.5 HOURS OF LABOR

As a condition to Owner's performance hereunder, Contractor shall comply with ORS 279C.520, as amended from time to time and incorporated herein by this reference:

Pursuant to ORS 279C.520 and as a condition to Owner's performance hereunder, no person shall be employed to

perform Work under this Contract for more than ten (10) hours in any one day or forty (40) hours in any one week, except in cases of necessity, emergency or where public policy absolutely requires it. In such instances, Contractor shall pay the employee at least time and a half pay:

(a) For all overtime in excess of eight (8) hours a day or forty (40) hours in any one week when the work week is five consecutive Days, Monday through Friday; or

(b) For all overtime in excess of ten (10) hours a day or forty (40) hours in any one week when the work week is four consecutive Days, Monday through Friday; and

(c) For all Work performed on Saturday and on any legal holiday specified in ORS 279C.540.

This section C.5 will not apply to Contractor's Work under this Contract if Contractor is currently a party to a collective bargaining agreement with any labor organization.

This Section C.5 shall not excuse Contractor from completion of the Work within the time required under this Contract.

SECTION D CHANGES IN THE WORK

D.1 CHANGES IN WORK

D.1.1 The terms of this Contract shall not be waived, altered, modified, supplemented or amended in any manner whatsoever without prior written approval of the Owner's Authorized Representative, and then only in a manner consistent with the Change Order provisions of this Section D.1 and after any necessary approvals required by public contracting laws have been obtained. Otherwise, a formal contract amendment is required, which shall not be effective until its execution by the parties to this Contract and all approvals required by public contracting laws have been obtained.

D.1.2 It is mutually agreed that changes in Plans, quantities, or details of construction are inherent in the nature of construction and may be necessary or desirable during the course of construction. Within the general scope of this Contract, the Owner's Authorized Representative may at any time, without notice to the sureties and without impairing the Contract, require changes consistent with this Section D.1. All Change Order Work shall be executed under the conditions of the Contract Documents. Such changes may include, but are not limited to:

(a) Modification of specifications and design.

(b) Increases or decreases in quantities.

(c) Increases or decreases to the amount of Work.

- (d) Addition or elimination of any Work item.
- (e) Change in the duration of the project.
- (f) Acceleration or delay in performance of Work.
- (g) Deductive changes.

Deductive changes are those that reduce the scope of the Work, and shall be made by mutual agreement whenever feasible. In cases of suspension or partial termination under Section J, Owner reserves the right to unilaterally impose a deductive change and to self perform such Work, for which the provisions of B.13 (Owner's Right to Do Work) shall then apply.

Adjustments in compensation shall be made under the provisions of D.1.3, in which costs for deductive changes shall be based upon the percentages for labor, equipment, material and Subcontractor mark-ups specified therein, unless otherwise agreed to by Owner.

D.1.3 The Owner and Contractor agree that Change Order Work shall be administered and compensated according to the following:

- (a) Unit pricing may be utilized at the Owner's option when unit prices or solicitation alternates were provided that established the cost for additional Work, and a binding obligation exists under the Contract on the parties covering the terms and conditions of the additional Work.
- (b) If the Owner elects not to utilize unit pricing, or in the event that unit pricing is not available or appropriate, fixed pricing may be used for Change Order Work. In fixed pricing the basis of payments or total price shall be agreed upon in writing between the parties to the Contract, and shall be established before the Work is done whenever feasible. The mark-ups set forth in D.1.3(c) shall be utilized by the parties as a guide in establishing fixed pricing, and will not be exceeded by Owner without adequate justification. Cost and price data relating to Change Orders shall be supplied by Contractor to Owner upon request, but Owner shall be under no obligation to make such requests.
- (c) In the event that unit pricing and fixed pricing are not utilized, then Change Order Work shall be performed on a cost reimbursement basis for Direct Costs. Such Work shall be compensated on the basis of the actual, reasonable and allowable cost of labor, equipment, and material furnished on the Work performed. Labor rates shall not exceed contract BOLI labor rate plus fringe plus contractor proven burden. In addition, the following markups shall be added to the Contractor's or Subcontractor's Direct Costs as full compensation for profit, Overhead and other indirect costs for Work directly performed with the Contractor's or Subcontractor's own forces:

On Labor..... 12%
 On Equipment..... 8%

On Materials..... 8%

When Change Order Work under D.1.3(c) is invoiced by an authorized Subcontractor at any level, each ascending tier Subcontractor or Contractor will be allowed a supplemental mark-up on each piece of subcontract Work covered by such Change Order as follows:

\$0.00 - \$5,000.00 10%, and then
 Over \$5,000.00 5%

Payments made to the Contractor shall be complete compensation for Overhead, profit, and all costs that were incurred by the Contractor or by other forces furnished by the Contractor, including Subcontractors, for Change Order Work. Owner may establish a maximum cost for Change Order Work under this Section D.1.3(c), which shall not be exceeded for reimbursement without additional written authorization from Owner. Contractor shall not be required to complete such Change Order Work without additional authorization.

D.1.4 Any necessary adjustment of Contract Time that may be required as a result of a Change Order must be agreed upon by the parties before the start of the Change Order Work unless Owner's Authorized Representative authorizes Contractor to start the Work before agreement on Contract Time adjustment. Contractor shall submit any request for additional compensation (and additional Contract Time if Contractor was authorized to start Work before an adjustment of Contract Time was approved) as soon as possible but no later than thirty (30) Days after receipt of the Change Order. If Contractor's request for additional compensation or adjustment of Contract Time is not made within the thirty (30) day time limit, Contractor's requests pertaining to that Change Order are barred. The thirty (30) day time limit for making requests shall not be extended for any reason, including without limitation Contractor's claimed inability to determine the amount of additional compensation or adjustment of Contract Time, unless an extension is granted in writing by Owner. If Contractor and Owner's Authorized Representative cannot agree on additional compensation or additional Contract Time needed to perform Change Order Work, Contractor may proceed to file a Claim under Section D.3, Claims Review Process. No other reimbursement, compensation, or payment will be made, except as provided in Section D.1.5 for impact claims.

D.1.5 If any Change Order Work under Section D.1.3 causes an increase or decrease in the Contractor's cost of, or the Contract Time required for the performance of, any other part of the Work under this Contract, the Contractor must submit a written request to the Owner's Authorized Representative, setting forth the nature and specific extent of the request, including all time and cost impacts against the Contract as soon as possible, but no later than thirty (30) Days after receipt of the Change Order by Contractor.

The thirty (30) day time limit applies to claims of Subcontractors, suppliers, or manufacturers that may be affected by the Change Order and that request additional compensation or an extension of Contract Time to perform; Contractor has responsibility for contacting its Subcontractors, suppliers, or manufacturers within the thirty (30) day time limit, and including their requests with Contractor's requests. If the request involves Work to be completed by Subcontractors, or materials to be furnished by suppliers or manufacturers, such requests shall be submitted to the Contractor in writing with full analysis and justification for the compensation and additional Contract Time requested. The Contractor will analyze and evaluate the merits of the requests submitted by Subcontractors, suppliers, and manufacturers to Contractor prior to including those requests and Contractor's analysis and evaluation of those requests with Contractor's requests for additional compensation or Contract Time that Contractor submits to the Owner's Authorized Representative. Failure of Subcontractors, suppliers, manufacturers or others to submit their requests to Contractor for inclusion with Contractor's requests submitted to Owner's Authorized Representative within the time period and by the means described in this section shall constitute a waiver of these Subcontractor claims. The Owner's Authorized Representative and the Owner will not consider direct requests or claims from Subcontractors, suppliers, manufacturers or others not a party to this Contract. The consideration of such requests and claims under this section does not give any person, not a party to the Contract the right to bring a claim against the Owner, whether in this claims process, in litigation, or in any dispute resolution process.

If the Contractor does not concur with the decision of the Owner's Authorized Representative, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

D.1.6 No request or Claim by the Contractor for additional costs or an extension of Contract Time shall be allowed if made after receipt of final payment application under this Contract. Contractor agrees to submit its final payment application within ninety (90) days after Substantial Completion, unless written extension is granted by Owner. Contractor shall not delay final payment application for any reason, including without limitation nonpayment of Subcontractors, suppliers, manufacturers or others not a party to this Contract, or lack of resolution of a dispute with Owner or any other person of matters arising out of or relating to the Contract. If Contractor fails to submit its final payment application within ninety (90) days after Substantial Completion, and Contractor has not obtained written extension by Owner, all requests or Claims for additional costs or an extension of Contract Time shall be waived.

D.1.7 It is understood that changes in the Work are inherent in construction of this type. The number of changes, the scope of those changes, and the effect they have on the progress of the original Work cannot be defined at this time. The Contractor is notified that numerous changes may be required and that there will be no compensation made to the Contractor directly related to the number of changes. Each change will be evaluated for extension of Contract Time and increase or decrease in compensation based on its own merit.

D.2 DELAYS

D.2.1 Delays in construction include "Avoidable Delays", which are defined in Section D.2.1.1, and "Unavoidable Delays", which are defined in Section D.2.1.2. The effect of Avoidable Delays is described in Section D.2.2 and the effect of Unavoidable Delays is described in Section D.2.3.

D.2.1.1 Avoidable Delays include any delays other than Unavoidable Delays, and include delays that otherwise would be considered Unavoidable Delays but that:

(a) Could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its Subcontractors.

(b) Affect only a portion of the Work and do not necessarily prevent or delay the prosecution of other parts of the Work nor the completion of the whole Work within the Contract Time.

(c) Do not impact activities on the accepted critical path schedule.

(d) Are associated with the reasonable interference of other contractors employed by the Owner that do not necessarily prevent the completion of the whole Work within the Contract Time.

D.2.1.2 Unavoidable Delays include delays other than Avoidable Delays that are:

(a) Caused by any actions of the Owner, Owner's Authorized Representative, or any other employee or agent of the Owner, or by separate contractor employed by the Owner.

(b) Caused by any site conditions which differ materially from what was represented in the Contract Documents or from conditions that would normally be expected to exist and be inherent to the construction activities defined in the Contract Documents. The Contractor shall notify the Owner's Authorized Representative immediately of differing site conditions before the area has been disturbed. The Owner's Authorized Representative will investigate the area and make a determination as to whether or not the conditions differ materially from either the conditions stated in the Contract Documents or those which could reasonably be expected in execution of this particular

Contract. If Contractor and the Owner's Authorized Representative agree that a differing site condition exists, any additional compensation or additional Contract Time will be determined based on the process set forth in Section D.1.5 for Change Order Work. If the Contractor does not concur with the decision of the Owner's Authorized Representative and/or believes that it is entitled to additional compensation or Contract Time, or both, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process.

(c) Caused by Force Majeure acts, events or occurrences that could not have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its Subcontractors.

(d) Caused by adverse weather conditions. Any adverse weather conditions must be substantiated by documentary evidence that weather conditions were abnormal for the specific time period claimed, could not have been anticipated by the Contractor, and adversely impacted the project in a manner that could not be avoided by rescheduling the Work or by implementing measures to protect against the weather so that the Work could proceed. A rain, windstorm, high water, or other natural phenomenon for the specific locality of the Work, which might reasonably have been anticipated from the previous 10-year historical records of the general locality of the Work, shall not be construed as abnormal. The parties agree that rainfall greater than the following levels cannot be reasonably anticipated:

(i) Daily rainfall equal to, or greater than, 0.50 inch during a month when the monthly rainfall exceeds the normal monthly average by twenty-five percent (25 %) or more.

(ii) daily rainfall equal to, or greater than, 0.75 inch at any time.

The Office of the Environmental Data Service of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce nearest the project site shall be considered the official agency of record for weather information.

D.2.2 Except as otherwise provided in ORS 279C.315, Contractor shall not be entitled to additional compensation or additional Contract Time for Avoidable Delays.

D.2.3 In the event of Unavoidable Delays, based on principles of equitable adjustment, Contractor may be entitled to the following:

(a) Contractor may be entitled to additional compensation or additional Contract Time, or both, for Unavoidable Delays described in Section D.2.1.2 (a) and (b).

(b) Contractor may be entitled to additional Contract Time for Unavoidable Delays described in Section D.2.1.2(c) and (d).

In the event of any requests for additional compensation or additional Contract Time, or both, as applicable, arising under this Section D.2.3 for Unavoidable Delays, other than requests for additional compensation or additional Contract Time for differing site conditions for which a review process is established under Section D.2.1.2 (b), Contractor shall submit a written notification of the delay to the Owner's Authorized Representative within two (2) Days of the occurrence of the cause of the delay. This written notification shall state the cause of the potential delay, the project components impacted by the delay, and the anticipated additional Contract Time or the additional compensation, or both, as applicable, resulting from the delay. Within seven (7) Days after the cause of the delay has been mitigated, or in no case more than thirty (30) Days after the initial written notification, the Contractor shall submit to the Owner's Authorized Representative, a complete and detailed request for additional compensation or additional Contract Time, or both, as applicable, resulting from the delay. If the Contractor does not concur with the decision of the Owner's Authorized Representative and/or believes that it is entitled to additional compensation, or additional Contract Time, or both, as applicable, the Contractor may proceed to file a Claim under Section D.3, Claims Review Process. If Contractor does not timely submit the notices required under this Section D.2.1.3(b), then unless otherwise prohibited by law, Contractor's Claim shall be barred.

D.3 CLAIMS REVIEW PROCESS

D.3.1 All Contractor Claims shall be referred to the Owner's Authorized Representative for review. Contractor's Claims, including Claims for additional compensation or additional Contract Time, shall be submitted in writing by Contractor to the Owner's Authorized Representative within five (5) Days after Contractor's initial request has been denied. Within thirty (30) Days after the initial Claim, Contractor shall submit to the Owner's Authorized Representative, a complete and detailed description of the Claim (the "Detailed Notice") that includes all information required by Section D.3.2. Unless the Claim is made in accordance with these time requirements, it shall be waived.

D.3.2 The Detailed Notice of the Claim shall be submitted in writing by Contractor and shall include a detailed, factual statement of the basis of the Claim, pertinent dates, Contract provisions which support or allow the Claim, reference to or copies of any documents which support the Claim, the dollar value of the Claim, and the Contract Time extension requested for the Claim. If the Claim involves Work to be completed by Subcontractors, the Contractor will analyze and evaluate the merits of the Subcontractor claim prior to forwarding it and that analysis and evaluation to the Owner's Authorized Representative. The Owner's Authorized Representative and the Owner will not consider direct claims from Subcontractors, suppliers,

manufacturers, or others not a party to this Contract. Contractor agrees that it will make no agreement, covenant, or assignment, nor will it commit any other act that will permit or assist any Subcontractor, supplier, manufacturer, or other to directly or indirectly make a claim against Owner.

D.3.3 The Owner's Authorized Representative will review all Claims and take one or more of the following preliminary actions within ten (10) Days of receipt of the Detailed Notice of a Claim: (1) request additional supporting information from the Contractor; (2) inform the Contractor and Owner in writing of the time required for adequate review and response; (3) reject the Claim in whole or in part and identify the reasons for rejection; (4) based on principles of equitable adjustment, recommend approval of all or part of the Claim; or (5) propose an alternate resolution.

D.3.4 The Owner's Authorized Representative's decision shall be final and binding on the Contractor unless appealed by written notice to the Owner within fifteen (15) Days of receipt of the decision. The Contractor must present written documentation supporting the Claim within fifteen (15) Days of the notice of appeal. After receiving the appeal documentation, the Owner shall review the materials and render a decision within thirty (30) Days after receiving the appeal documents.

D.3.5 The decision of the Owner shall be final and binding unless the Contractor delivers to the Owner its requests for mediation, which shall be a non-binding process, within fifteen (15) Days of the date of the Owner's decision. The mediation process will be considered to have commenced as of the date the Contractor delivers the request. Both parties acknowledge and agree that participation in mediation is a prerequisite to commencement of litigation of any disputes relating to the Contract. Both parties further agree to exercise their best efforts in good faith to resolve all disputes within sixty (60) Days of the commencement of the mediation through the mediation process set forth herein.

In the event that a lawsuit must be filed within this sixty (60) day period in order to preserve a cause of action, the parties agree that notwithstanding the filing, they shall proceed diligently with the mediation to its conclusion prior to actively prosecuting the lawsuit, and shall seek from the Court in which the lawsuit is pending such stays or extensions, including the filing of an answer, as may be necessary to facilitate the mediation process. Further, in the event settlements are reached on any issues through mediation, the parties agree to promptly submit the appropriate motions and orders documenting the settlement to the Court for its signature and filing.

D.3.6 The mediator shall be an individual mutually acceptable to both parties, but in the absence of agreement each party shall select a temporary mediator and the

temporary mediators shall jointly select the permanent mediator. Each party shall pay its own costs for the time and effort involved in mediation. The cost of the mediator shall be split equally between the two parties. Both parties agree to exercise their best effort in good faith to resolve all disputes in mediation. Participation in mediation is a mandatory requirement of both the Owner and the Contractor. The schedule, time and place for mediation will be mutually acceptable, or, failing mutual agreement, shall be as established by the mediator. The parties agree to comply with Owner's administrative rules governing the confidentiality of mediation, if any, and shall execute all necessary documents to give effect to such confidentiality rules. In any event, the parties shall not subpoena the mediator or otherwise require the mediator to produce records, notes or work product, or to testify in any future proceedings as to information disclosed or representations made in the course of mediation, except to the extent disclosure is required by law.

D.3.7 Unless otherwise directed by Owner's Authorized Representative, Contractor shall proceed with the Work while any Claim of Contractor is pending, including a Claim for additional compensation or additional Contract Time resulting from Change Order Work. Regardless of the review period or the final decision of the Owner's Authorized Representative, the Contractor shall continue to diligently pursue the Work as identified in the Contract Documents. In no case is the Contractor justified or allowed to cease Work without a written stop work order from the Owner or Owner's Authorized Representative.

D.3.8 Unless otherwise directed by Owner's Authorized Representative, Contractor shall proceed with the Work. This schedule will provide a breakdown of values for the contracted Work and will be the basis for progress payments. The breakdown will demonstrate reasonable, identifiable, and measurable components of the Work. Unless objected to by the Owner's Authorized Representative, this schedule shall be used as the basis for reviewing Contractor's applications for payment. If objected to by Owner's Authorized Representative, Contractor shall revise the schedule of values and resubmit the same for approval of Owner's Authorized Representative.

SECTION E **PAYMENTS**

E.1 SCHEDULE OF VALUES

E.1 The Contractor shall submit, at least ten (10) Days prior to submission of its first application for progress payment, a schedule of values ("Schedule of Values") for the contracted Work. This schedule will provide a breakdown of values for the contracted Work and will be the basis for progress payments. The breakdown will demonstrate reasonable, identifiable, and measurable components of the

Work. Unless objected to by the Owner's Authorized Representative, this schedule shall be used as the basis for reviewing Contractor's applications for payment. If objected to by Owner's Authorized Representative, Contractor shall revise the schedule of values and resubmit the same for approval of Owner's Authorized Representative.

E.1.1 The schedule of values shall allocate at least three percent (3%) of the Contract Sum as a separate line item for that portion of the work between Substantial Completion and Final Completion, including without limitation punch list completion and furnishing of deliverables (including but not limited to approved operations and maintenance data, approved record documents, warranties and bonds, delivery of extra stock, and all other documentation or items of the work required for final completion final payment), which will be earned and paid as part of the final payment. This line item shall be entitled "Final Documentation and Punch list Completion. This percentage is not the statutory retainage described in ORS 279C.570 or any other retainage but rather requires the contractor to recognize that the contractor and its subcontractors will expend significant cost in advancing the work from substantial completion to final completion, and that this amount is not earned until final completion of the work is accomplished. At its sole discretion, the owner may release portions of this amount progressively as items are completed.

E.2 APPLICATIONS FOR PAYMENT

E.2.1 Owner shall make progress payments on the Contract monthly as Work progresses. Payments shall be based upon estimates of Work completed and the Schedule of Values. All payments shall be approved by the Owner's Authorized Representative. A progress payment shall not be considered acceptance or approval of any Work or waiver of any defects therein. Owner shall pay to Contractor interest on the progress payment, not including retainage, due the Contractor. The interest shall commence thirty (30) Days after the receipt of invoice ("application for payment") from the Contractor or fifteen (15) Days after the payment is approved by the Owner's Authorized Representative, whichever is the earlier date. The rate of interest shall equal three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is thirty (30) Days after receipt of the application for payment from the Contract or fifteen (15) Days after the payment is approved by the Owner, whichever is the earlier date, but the rate of interest shall not exceed thirty (30) percent. Notwithstanding the foregoing, in instances when an application for payment is filled out incorrectly, or when there is any defect or impropriety in any submitted application or when there is a good faith dispute, Owner shall so notify the Contractor within fifteen (15) Days stating the reason or reasons the application for payment is

defective or improper or the reasons for the dispute. A defective or improper application for payment, if corrected by the Contractor within seven (7) Days of being notified by the Owner, shall not cause a payment to be made later than specified in this section unless interest is also paid. Accrual of interest will be postponed when payment on the principal is delayed because of disagreement between the Owner and the Contractor.

E.2.2 Contractor shall submit to the Owner's Authorized Representative, an application for each payment and, if required, receipts or other vouchers showing payments for materials and labor, including payments to Subcontractors. Contractor shall include, in its application for payment, a schedule of the percentages of the various parts of the Work completed, based on the Schedule of Values which shall aggregate to the payment application total, and shall include, on the face of each copy thereof, a certificate in substantially the following form:

"I, the undersigned, hereby certify that the above bill is true and correct, and the payment therefore, has not been received.

Signed: _____"

E.2.3 Generally, applications for payment will be accepted only for materials that have been installed. Under special conditions, applications for payment for stored materials will be accepted at Owner's sole discretion. Such a payment, if made, will be subject to the following conditions:

- (a) The request for stored material shall be submitted at least thirty (30) Days in advance of the application for payment on which it appears. Applications for payment shall be entertained for major equipment, components or expenditures only.
- (b) The Contractor shall submit applications for payment showing the quantity and cost of the material stored.
- (c) The material shall be stored in a bonded warehouse and Owner's Authorized Representative shall be granted the right to access the material for the purpose of removal or inspection at any time during the Contract Period.
- (d) The Contractor shall name the Owner as co-insured on the insurance policy covering the full value of the property while in the care and custody of the Contractor until it is installed. A certificate noting this coverage shall be issued to the Owner.
- (e) Payments shall be made for materials only. The submitted amount of the application for payment shall be reduced by the cost of transportation and for the cost of an inspector to check the delivery at out of town storage sites. The cost of said inspection shall be borne solely by the Contractor.

(f) Within sixty (60) Days of the application for payment, the Contractor shall submit evidence of payment covering the material stored.

(g) Payment for stored materials shall in no way indicate acceptance of the materials or waive any rights under this Contract for the rejection of the Work or materials not in conformance with the Contract Documents.

(h) All required documentation must be submitted with the respective application for payment.

E.2.4 The Owner reserves the right to withhold all or part of a payment, or may nullify in whole or part any payment previously made, to such extent as may be necessary in the Owner's opinion to protect the Owner from loss because of:

(a) Work that is defective and not remedied, or that has been demonstrated or identified as failing to conform with the Contract Documents,

(b) third party claims filed or evidence reasonably indicating that such claims will likely be filed unless security acceptable to the Owner is provided by the Contractor;

(c) failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment (in which case Owner may issue checks made payable jointly to Owner and such unpaid persons under this provision, or directly to Subcontractors and suppliers at any level under Section C.3.2.1);

(d) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price;

(e) damage to the Owner or another contractor;

(f) reasonable evidence that the Work will not be completed within the Contract Time required by the Contract, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;

(g) failure to carry out the Work in accordance with the Contract Documents; or

(h) assessment of liquidated damages, when withholding is made for offset purposes.

E.2.5 Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

(a) Take that portion of the Contract Price properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the total Contract Price allocated to that portion of the Work in the Schedule of Values, less retainage as provided in Section E.5. Pending final determination of

cost to the Owner of changes in the Work, amounts not in the dispute may be included even though the Contract Price has not yet been adjusted by Change Order;

(b) Add that portion of the Contract Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner pursuant to Section E.2.3, suitably stored off the site at a location agreed upon in writing), less retainage as provided in Section E.5;

(c) Subtract the aggregate of previous payments made by the Owner; and

(d) Subtract any amounts for which the Owner's Authorized Representative has withheld or nullified payment as provided in the Contract Documents.

E.2.6 Contractor's applications for payment may not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier.

E.2.7 The Contractor warrants to Owner that title to all Work covered by an application for payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an application for payment all Work for which payments are received from the Owner shall be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

E.2.8 If Contractor disputes any determination by Owner's Authorized Representative with regard to any application for payment, Contractor nevertheless shall continue to prosecute expeditiously the Work. No payment made hereunder shall be or be construed to be final acceptance or approval of that portion of the Work to which such partial payment relates or shall relieve Contractor of any of its obligations hereunder.

E.3 PAYROLL CERTIFICATION REQUIREMENT

Payroll certification is required before payments are made on the Contract. Refer to Section C.2 for this information.

E.4 NOT USED

E.5 RETAINAGE

E.5.1 Retainage shall be withheld and released in accordance with ORS 279C.550 to 279C.580:

E.5.1.1 Owner may reserve as retainage from any progress payment an amount not to exceed five percent of the payment. As Work progresses, Owner may reduce the amount of the retainage and may eliminate retainage on any

remaining monthly Contract payments after 50 percent of the Work under the Contract is completed if, in the Owner's opinion, such Work is progressing satisfactorily. Elimination or reduction of retainage shall be allowed only upon written application by the Contractor, which application shall include written approval of Contractor's surety; except that when the Work is 97-1/2 percent completed the Owner may, at its discretion and without application by the Contractor, reduce the retained amount to 100 percent of the value of the Work remaining to be done. Upon receipt of written application by the Contractor, Owner shall respond in writing within a reasonable time.

E.5.1.2 In accordance with the provisions of ORS 279C.560 and any applicable administrative rules, Contractor may request in writing:

(a) to be paid amounts which would otherwise have been retained from progress payments where Contractor has deposited acceptable bonds and securities of equal value with Owner or in a custodial account or other mutually-agreed account satisfactory to Owner, with an approved bank or trust company to be held in lieu of the cash retainage for the benefit of Owner;

(b) that retainage be deposited in an interest bearing account, established through the State Treasurer for state agencies, in a bank, savings bank, trust company or savings association for the benefit of Owner, with earnings from such account accruing to the Contractor; or

(c) that the Owner allow Contractor to deposit a surety bond for the benefit of Owner, in a form acceptable to Owner, in lieu of all or a portion of funds retained, or to be retained. Such bond and any proceeds therefrom shall be made subject to all claims and liens in the manner and priority as set forth for retainage under ORS 279C.550 to ORS 279C.625.

Where the Owner has accepted the Contractor's election of option (a) or (b), Owner may recover from Contractor any additional costs incurred through such election by reducing Contractor's final payment. Where the Owner has agreed to Contractor's request for option (c), Contractor shall accept like bonds from Subcontractors and suppliers on the project from which Contractor has required retainage.

E.5.1.3 The retainage held by Owner shall be included in and paid to the Contractor as part of the final payment of the Contract Price. The Owner shall pay to Contractor interest at the rate of one and one-half percent per month on the final payment due Contractor, interest to commence thirty (30) Days after the Work under the Contract has

been completed and accepted and to run until the date Contractor shall notify Owner in writing when the Contractor considers the Work complete and Owner shall, within fifteen (15) Days after receiving the written notice, either accept the Work or notify the Contractor of Work yet to be performed on the Contract. If Owner does not within

the time allowed notify the Contractor of Work yet to be performed to fulfill contractual obligations, the interest provided by this subsection shall commence to run thirty (30) Days after the end of the 15-Day period.

E.5.1.4 In accordance with the provisions of ORS 279C.560, Owner shall reduce the amount of the retainage if the Contractor notifies the controller of the Owner that the Contractor has deposited in an escrow account with a bank or trust company, in a manner authorized by the Owner's Authorized Representative, bonds and securities of equal value of a kind approved by the Owner's Authorized Representative.

E.5.1.5 Contractor agrees that if Contractor elects to reserve a retainage from any progress payment due to any Subcontractor or supplier, such retainage shall not exceed five percent of the payment, and such retainage withheld from Subcontractors and suppliers shall be subject to the same terms and conditions stated in Subsection E.5 as apply to Owner's retainage from any progress payment due to Contractor.

E.6 FINAL PAYMENT

E.6.1 Upon completion of all the Work under this Contract, the Contractor shall notify the Owner's Authorized Representative, in writing, that Contractor has completed Contractor's part of the Contract and shall request final payment. Upon receipt of such notice the Owner's Authorized Representative will inspect the Work, and if acceptable, submit to the Owner a recommendation as to acceptance of the completed Work and as to the final estimate of the amount due the Contractor. If the Work is not acceptable, Owner will notify Contractor within fifteen (15) Days of Contractor's request for final payment. Upon approval of this final estimate by the Owner and compliance by the Contractor with provisions in Section K. 3 AFFIDAVIT/RELEASE OF LIENS AND CLAIMS, and other provisions as may be applicable, the Owner shall pay to the Contractor all monies due under the provisions of these Contract Documents.

E.6.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Owner's Authorized Representative (1) a notarized affidavit/release of liens and claims in a form satisfactory to Owner that states that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least thirty (30) Days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period

required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

E.6.3 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final application for payment.

E.7 PENALTIES

E.7.1 Should the Contractor fail to substantially complete the Work on or before the date stipulated for Substantial Completion (or such later date as may result from extension of time granted by Owner), Contractor shall pay the Owner, as a penalty, the sum specified in the Contract for each consecutive calendar day that terms of the contract remain unfulfilled beyond the date allowed by the Contract, which sum is agreed upon as a reasonable and proper measure of damages which the Owner will sustain per day by failure of the Contractor to complete on schedule is uncertain and cannot be computed exactly.

E.7.2 For each consecutive calendar day that the Work remains incomplete after the date established for Final Completion, the Owner will retain from the compensation otherwise to be paid to the Contractor the sum specified in the Contract. This amount is the minimum measure of damages the Owner will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up and other miscellaneous tasks as required to complete all work specified. This amount is in addition to the penalty prescribed above.

E.7.3 For the purposes of penalties, the date of Final Completion shall be the date as stated in the Architect/Engineer's letter to the Owner that the Project is finally complete.

SECTION F **JOB SITE CONDITIONS**

F.1 USE OF PREMISES

Contractor shall confine equipment, storage of materials and operation of Work to the limits indicated by Contract Documents, law, ordinances, permits or directions of the Owner's Authorized Representative. Contractor shall follow the Owner's Authorized Representative's instructions regarding use of premises, if any.

F.2 PROTECTION OF WORKERS, PROPERTY, AND THE PUBLIC

F.2.1 Contractor shall maintain continuous and adequate protection of all of the Work from damage, and shall protect the Owner's Authorized Representative, Owner's workers and property from injury or loss arising in connection with this Contract. Contractor shall remedy acceptably to the Owner, any damage, injury, or loss, except such as may be directly due to errors in the Contract Documents or caused by authorized representatives or personnel of the Owner. Contractor shall adequately protect adjacent property as provided by law and the Contract Documents.

F.2.2 Contractor shall take all necessary precautions for the safety of all personnel on the job site, and shall comply with the Contract Documents and all applicable provisions of federal, state and municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the Work is being performed. Contractor shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for protection of workers and the public against any hazards created by construction. Contractor shall designate a responsible employee or associate on the Work site, whose duty shall be the prevention of accidents. The name and position of the person designated shall be reported to the Owner's Authorized Representative. The Owner's Authorized Representative has no responsibility for Work site safety. Work site safety is the responsibility of the Contractor.

F.2.3 Contractor shall not enter upon private property without first obtaining permission from the property owner or its duly authorized representative. Contractor shall be responsible for the preservation of all public and private property along and adjacent to the Work contemplated under the Contract and shall use every precaution necessary to prevent damage thereto. In the event the Contractor damages any property, the Contractor shall at once notify the property owner and make, or arrange to make, full restitution. Contractor shall report, immediately in writing, to the Owner's Authorized Representative, all pertinent facts relating to such property damage and the ultimate disposition of the claim for damage.

F.2.4 Contractor is responsible for protection of adjacent work areas including impacts brought about by activities, equipment, labor, utilities, and materials on the site.

F.2.5 Contractor shall at all times direct its activities in such a manner as to minimize adverse effects on the environment. Handling of all materials will be conducted so no release will occur that may pollute or become hazardous.

F.2.6 In an emergency affecting the safety of life or of the Work or of adjoining property, the Contractor, without special instruction or authorization from the Owner's Authorized Representative, shall act reasonably to prevent threatened loss or injury, and shall so act, without appeal, if instructed by the Owner's Authorized Representative. Any compensation claimed by the Contractor on account of emergency work shall be determined in accordance with Section D.

F.3 CUTTING AND PATCHING

F.3.1 Contractor shall be responsible for coordinating all cutting, fitting, or patching of the Work to make its several parts come together properly and fit to receive or be received by work of other contractors or Subcontractors shown upon, or reasonably implied by, the Contract Documents.

F.3.2 Contractor shall be responsible for restoring all cut, fitted, or patched surfaces to an original condition; provided, however, that if a different condition is specified in the Contract Documents, then Contractor shall be responsible for restoring such surfaces to the condition specified in the Contract Documents.

F.4 CLEANING UP

From time to time as may be ordered by the Owner the Contractor shall, at its own expense, clean up and remove all refuse and unused materials of any kind resulting from the Work. If Contractor fails to do so within twenty-four hours after notification by the Owner the work may be done by others and the cost charged to the Contractor and deducted from payment due the Contractor.

F.5 ENVIRONMENTAL CONTAMINATION

F.5.1 Contractor will be held responsible for and shall indemnify, defend (with counsel of Owner's choice) and hold harmless Owner from and against any costs, expenses, damages, claims, and causes of action, (including attorney fees), or any of them, resulting from all spills, releases, discharges, leaks and disposal of environmental pollution, including storage, transportation, and handling during the performance of the Contract which occur as a result of, or are contributed by, the negligence or actions of

Contractor or its personnel, agents, or Subcontractors or any failure to perform in accordance with the Contract Documents (except to the extent otherwise void under ORS 30.140). Nothing in this section F.5.1 shall limit Contractor's responsibility for obtaining insurance coverage required under Section G.3 of these General Conditions,

and Contractor shall take no action that would void or impair such coverages

F.5.1.1 Contractor agrees to promptly dispose of such spills, releases, discharge or leaks to the satisfaction of Owner and proper regulatory agencies in a manner that complies with applicable federal, state, and local laws and regulations. Cleanup shall be at no cost to the Owner and be performed by properly qualified personnel.

F.5.1.2 Contractor shall obtain the Owner's written consent prior to bringing onto the Work site any (i) environmental pollutants or (ii) hazardous substances or materials, as the same or reasonably similar terms are used in any applicable federal, state, or local statutes, rules or ordinances. Notwithstanding such written consent from the Owner, the Contractor, at all times, shall:

(a) properly handle, use and dispose of all environmental pollutants and hazardous substances or materials brought onto the Work site, in accordance with all applicable federal, state, or local statutes, rules, or ordinances;

(b) be responsible for any and all spills, releases, discharges, or leaks of (or from) environmental pollutants or hazardous substances or materials which Contractor has brought onto the Work site; and

(c) promptly clean up, without cost to the Owner, such spills, releases, discharges, or leaks to the Owner's satisfaction and in compliance with all applicable federal, state, or local statutes, rules or ordinances.

F.5.2 Contractor shall report all reportable quantity releases to applicable federal, state, and local regulatory and emergency response agencies. Reportable quantities are found in 40 CFR Part 302, Table 302.4 for hazardous substances and in OAR Chapter 340 Division 108 for all products addressed therein. Upon discovery, regardless of quantity, Contractor must telephonically report all releases to the Owner. A written follow-up report shall be submitted to Owner within 48 hours of the telephonic report. Such written report shall contain, as a minimum:

(a) Description of items released (identity, quantity, manifest no., and all other documentation required by law.)

(b) Whether amount of items released is EPA/DEQ reportable, and, if so, when it was reported.

(c) Exact time and location of release, including a description of the area involved.

(d) Containment procedures initiated.

(e) Summary of communications about the release Contractor has had with members of the press or State officials other than Owner.

- (f) Description of cleanup procedures employed or to be employed at the site, including disposal location of spill residue.
- (g) Personnel injuries, if any, resulting from, or aggravated by, the release.

F.6 ENVIRONMENTAL CLEAN-UP

F.6.1 Unless disposition of environmental pollution is specifically a part of this Contract, or was caused by the Contractor (reference F.5 Environmental Contamination), Contractor shall immediately notify Owner of any hazardous substance(s) which Contractor discovers or encounters during performance of the Work required by this Contract. "Hazardous substance(s)" means any hazardous, toxic and radioactive materials and those substances defined as "hazardous substances," "hazardous materials," "hazardous wastes," "toxic substances," or other similar designations in any federal, state, or local law, regulation, or ordinance, including without limitation asbestos, polychlorinated biphenyl (PCB), or petroleum, and any substances, materials or wastes regulated in 40 CFR, Part 261 and defined as hazardous in 40 CFR S 261.3. In addition to notifying Owner of any hazardous substance(s) discovered or encountered, Contractor shall immediately cease working in any particular area of the project where a hazardous substance(s) has been discovered or encountered if continued work in such area would present a risk or danger to the health or well being of Contractor's or any Subcontractor's work force.

F.6.2 Upon being notified by Contractor of the presence of hazardous substance(s) on the project site, Owner shall arrange for the proper disposition of such hazardous substance(s).

F.7 FORCE MAJEURE

A party to this Contract shall not be held responsible for delay or default due to Force Majeure acts, events or occurrences unless they could have been avoided by the exercise of reasonable care, prudence, foresight, and diligence by that party. The Owner may terminate this Contract upon written notice after determining that delay or default caused by Force Majeure acts, events or occurrences will reasonably prevent successful performance of the Contract.

SECTION G
INDEMNITY, BONDING, AND INSURANCE

G.1 RESPONSIBILITY FOR DAMAGES / INDEMNITY

G.1.1 Contractor shall be responsible for all damage to property, injury to persons, and loss, expense, inconvenience, and delay that may be caused by, or result from, the carrying out of the Work to be done under this Contract, or from any act, omission or neglect of the Contractor, its Subcontractors, personnel, or agents.

G.1.2 To the fullest extent permitted by law, Contractor shall indemnify, defend (with counsel approved by Owner) and hold harmless the Owner, Owner's Authorized Representative, Architect/Engineer, Architect/Engineer's consultants, and their respective officers, directors, agents, employees, partners, members, stockholders and affiliated companies (collectively "Indemnitees") from and against all liabilities, damages, losses, claims, expenses (including reasonable attorney fees), demands and actions of any nature whatsoever which arise out of, result from or are related to, (a) any damage, injury, loss, expense, inconvenience or delay described in this Section G.1.2, (b) any accident or occurrence which happens or is alleged to have happened in or about the project site or any place where the Work is being performed, or in the vicinity of either, at any time prior to the time the Work is fully completed in all respects, (c) any failure of the Contractor to observe or perform any duty or obligation under the Contract Documents which is to be observed or performed by the Contractor, or any breach of any agreement, representation or warranty of the Contractor contained in the Contract Documents or in any subcontract,

(d) the negligent acts or omissions of the Contractor, a Subcontractor or anyone directly or indirectly employed by them or any one of them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder (except to the extent otherwise void under ORS 30.140), and (e) any lien filed upon the project or bond claim in connection with the Work. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section G.1.2.

G.1.3 In claims against any person or entity indemnified under this Section G.1.2 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section G.1.2 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

G.2 PERFORMANCE AND PAYMENT SECURITY

G.2.1 When the Contract Price is \$100,000 or more the Contractor shall furnish and maintain in effect at all times during the Contract Period, a performance bond in a sum

equal to the Contract Price, and a separate payment bond also in a sum equal to the Contract Price. The bonds may be required if the Contract Price is less than \$100,000, if required by the Contract Documents.

G.2.2 Bond forms furnished by the Owner or Contractor's Surety and notarized by awarded Contractor's surety company authorized to do business in Oregon are the only acceptable forms of performance and payment security, unless otherwise specified in the Contract Documents.

G.3 INSURANCE

G.3.1 Primary Coverage: Insurance carried by Contractor under this Contract shall be the primary coverage, and the Owner's insurance is excess and solely for damages or losses for which the Owner is responsible. The coverages indicated are minimums unless otherwise specified in the Contract Documents.

G.3.2 Workers' Compensation: All employers, including Contractor, that employ subject workers who work under this contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. This shall include Employer's Liability Insurance with coverage limits of not less than \$100,000 for each accident. Contractors who perform the Work without the assistance or labor of any employee need not obtain such coverage if the

Contractor certifies so in writing. Contractor shall ensure that each of its Subcontractors complies with these requirements. The Contractor shall require proof of such Workers' Compensation by receiving and keeping on file a certificate of insurance from each Subcontractor or anyone else directly employed by either the Contractor or its Subcontractors.

G.3.3 Builder's Risk Insurance not required:

G.3.4 Liability Insurance:

G.3.4.1 Commercial General Liability: Contractor shall obtain, at Contractor's expense, and keep in effect during the term of this Contract, Commercial General Liability Insurance covering bodily injury and property damage in a form and with coverages that are satisfactory to the Owner. This insurance shall include personal injury liability, products and completed operations, and contractual liability coverage for the indemnity provided under this Contract (to the extent contractual liability coverage for the indemnity is available in the marketplace), and shall be issued on an occurrence basis. Combined single limit per occurrence shall not be less than \$1,000,000 for each job site or location. Each annual aggregate limit shall not be less than \$2,000,000.

G.3.4.2 Automobile Liability: Contractor shall obtain, at Contractor's expense, and keep in effect during the term of

this Contract, Automobile Liability Insurance covering owned, non-owned and/or hired vehicles, as applicable. The coverage may be written in combination with the Commercial General Liability Insurance. Combined single limit per occurrence shall not be less than \$1,000,000.00, or the equivalent.

G.3.4.3 "Tail" Coverage: If any of the required liability insurance is arranged on a "claims made" basis, "tail" coverage will be required at the completion of this Contract for a duration of 24 months or the maximum time period available in the marketplace if less than 24 months.

Contractor will be responsible for furnishing certification of "tail" coverage as described or continuous "claims made" liability coverage for 24 months following Final Completion. Continuous "claims made" coverage will be acceptable in lieu of "tail" coverage, provided its retroactive date is on or before the effective date of this Contract. This will be a condition of the final acceptance of Work or services and related warranty (if any).

G.3.5 Additional Insured: The liability insurance coverage, except Professional Liability if included, required for performance of this Contract shall include the Fern Ridge School District 28J, its board, departments, employees, and volunteers as Additional Insureds but only with respect to the Contractor's activities to be performed under this Contract. If Contractor cannot obtain an insurer to name the Fern Ridge School District 28J, its board, departments, employees, and volunteers as Additional Insureds, Contractor shall obtain at Contractor's expense, and keep in effect during the term of this Contract, Owners and Contractors Protective Liability Insurance, naming the Fern Ridge School District 28J, its board, departments, employees, and volunteers as Named Insureds with not less than a \$1,000,000.00 limit per occurrence. This policy must be kept in effect for 12 months following Final Completion. As evidence of coverage, Contractor shall furnish the actual policy to Owner prior to its issuance of a Notice to Proceed.

G.3.6 Notice of Cancellation or Change: There shall be no cancellation, material change, potential exhaustion coverages without thirty (30) Days' written notice from the Contractor or its insurer(s) to the Owner. Any failure to comply with the reporting provisions of this insurance, except for the potential exhaustion of aggregate limits, shall not affect the coverages provided to Fern Ridge School District 28J, its board, departments, employees, and volunteers.

G.3.7 Certificate(s) of Insurance: As evidence of the insurance coverage required by this Contract, the Contractor shall furnish certificate(s) of insurance to the Owner prior to its issuance of a Notice to Proceed. The certificate(s) will specify all of the parties who are Additional Insureds or Loss Payees. Insurance coverage required under this Contract shall be obtained from insurance companies or entities acceptable to the Owner that are allowed to provide such insurance under Oregon

law. Eligible insurers include admitted insurers that have been issued a certificate of authority from the Oregon Department of Consumer and Business Services authorizing them to do an insurance business in the state of Oregon, and certain non-admitted surplus lines insurers that satisfy the requirements of applicable Oregon law and are approved by the Owner. The certificates will also specify that there shall be no cancellation, material change, potential exhaustion of aggregate limits or intent not to renew insurance coverages without thirty (30) Days' written notice from the insurer(s) to the Owner. To the extent Certificates of Insurance contain words to the effect that Contractor shall "endeavor to send notice of cancellation" or similar language, Contractor shall require its insurer to send such notice by making sure that the words "endeavor to" or similar words are removed from the Certificate. The Contractor shall be financially responsible for all deductibles, self-insured retentions and/or self-insurance included hereunder. Any deductible, self-insured retention and/or self-insurance in excess of \$50,000 shall be approved by the Owner in writing prior to issuance of a Notice to Proceed and is subject to Owner's approval.

SECTION H **SCHEDULE OF WORK**

H.1 CONTRACT PERIOD

H.1.1 Time is of the essence on this Contract. The Contractor shall at all times carry on the Work diligently, without delay and punctually fulfill all requirements herein. Contractor shall commence Work on the site within fifteen (15) Days of Notice to Proceed, unless directed otherwise.

H.1.2 Unless specifically extended by Change Order, all Work shall be complete by the date contained in the Contract Documents. The Owner shall have the right to accelerate the completion date of the Work, which may require the use of overtime. Such accelerated Work schedule shall be an acceleration in performance of Work under Section D.1.2 (f) and shall be subject to the Change Order process of Section D.1.

H.1.3 The Owner shall not waive any rights under the Contract by permitting the Contractor to continue or complete the Work or any part of it after the date described in Section H.1.2 above.

H.2 SCHEDULE

H.2.1 To ensure work is completed within the time periods stated in the bidding documents and as stated on the Notice to Proceed; the Contractor shall develop a project schedule with appropriate milestones that include substantial and final completion for Owner approval. Contractor shall provide, by or before the pre-construction conference, a detailed schedule for review and acceptance by the Owner. The submitted schedule must illustrate Work by significant

project components; significant labor trades, long lead items, milestones, and be broken down by building and/or floor where applicable. Each schedule item shall account for no greater than 5 % of the monetary value of the project or 5 % of the available Contract Time. Schedules with activities of less than one day or valued at less than 1% of the Contract will be considered too detailed and will not be accepted. Schedules lacking adequate detail, or unreasonably detailed, will be rejected. Included within the schedule are the following: Notice to Proceed, Milestones, Substantial Completion, and Final Completion. Schedules will be updated monthly and submitted with the monthly payment application. Acceptance of the Schedule by the Owner does not constitute agreement by the Owner, as to the Contractor's sequencing, means, methods, or allocated Contract Time. Any positive difference between the Contractor's scheduled completion and the Contract completion date is float owned by the Owner. Owner reserves the right to negotiate the float if it is deemed to be in Owner's best interest to do so. In no case shall the Contractor make a claim for delays if the Work is completed within the Contract Time but after Contractor's scheduled completion.

H.3 PARTIAL OCCUPANCY OR USE

H.3.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage, provided such occupancy or use is consented to by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have reasonably accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, insurance or self-insurance, maintenance, heat, utilities, and damage to the Work, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents with respect to such portion of the Work. Approval by the Contractor to partial occupancy or use shall not be unreasonably withheld. Immediately prior to such partial occupancy or use, the Owner and Contractor shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work. Partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

SECTION I **CORRECTION OF WORK**

I.1 CORRECTION OF WORK BEFORE FINAL PAYMENT

The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects, and that the Work will conform to the requirements of the Contract Documents. Work failing to conform to these requirements shall be deemed defective. Contractor shall promptly remove from the premises and replace all defective materials and equipment as determined by the Owner's Authorized Representative, whether incorporated in the Work or not. Removal and replacement shall be without loss or expense to the Owner, and Contractor shall bear the cost of repairing all Work destroyed or damaged by such removal or replacement. Contractor shall be allowed a period of no longer than sixty (60) days for completion of defective (punch list) work, unless otherwise agreed. At the end of that period, or earlier if requested by the Contractor, Owner shall arrange for inspection of the Work by the Architect/Engineer. Should the Work not be complete, and all corrections made, the costs for all subsequent re-inspections shall be borne by the Contractor. If Contractor fails to complete the punch list work within the above time period, without affecting Contractor's obligations Owner may perform such work and Contractor shall reimburse Owner all costs of the same within thirty (30) days after demand.

I.2 WARRANTY WORK

I.2.1 Neither the final certificate of payment nor any provision of the Contract Documents shall relieve the Contractor from responsibility for defective Work and, unless a longer period is specified, Contractor shall correct all defects that appear in the Work within a period of one year from the date of issuance of the written notice of substantial completion by the Owner except for latent defects which will be remedied by the Contractor at any time they become apparent.

The Owner shall give Contractor notice of defects with reasonable promptness. Contractor shall perform such warranty work within a reasonable time after Owner's demand. If Contractor fails to complete the warranty work within such period as Owner determines reasonable, or at any time in the event of warranty work consisting of emergency repairs, without affecting Contractor's obligations, Owner may perform such work and Contractor shall reimburse Owner all costs of the same within thirty (30) Days after demand.

I.2.2 This provision does not negate guarantees or warranties for periods longer than one year including without limitation such guarantees or warranties required by other sections of the Contract

Documents for specific installations, materials, processes, equipment or fixtures.

I.2.3 In addition to Contractor's warranty, manufacturer's warranties shall pass to the Owner and shall not take effect until affected Work has been accepted in writing by the Owner's Authorized Representative.

I.2.4 The one-year period for correction of Work shall be extended with respect to portions of Work performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work, and shall be extended by corrective Work performed by the Contractor pursuant to this Section, as to the Work corrected. The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

I.2.5 Nothing contained in this Section I.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the period for correction of Work as described in this Section I.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

I.2.6 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Price will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

SECTION J SUSPENSION AND/OR TERMINATION OF THE WORK

J.1 OWNER'S RIGHT TO SUSPEND THE WORK

J.1.1 The Owner and/or the Owner's Authorized Representative has the authority to suspend portions or all of the Work due to the following causes:

- (a) Failure of the Contractor to correct unsafe conditions;
- (b) Failure of the Contractor to carry out any provision of the Contract;
- (c) Failure of the Contractor to carry out orders;
- (d) Conditions, in the opinion of the Owner's Authorized Representative, which are unsuitable for performing the Work;
- (e) Time required to investigate differing site conditions;

(f) Any reason considered to be in the public interest.

J.1.2 The Owner shall notify Contractor and the Contractor's Surety in writing of the effective date and time of the suspension and shall notify Contractor and its surety in writing to resume Work.

J.2 CONTRACTOR'S RESPONSIBILITIES

J.2.1 During the period of the suspension, Contractor is responsible to continue maintenance at the project just as if the Work were in progress. This includes, but is not limited to, protection of completed Work, maintenance of access, protection of stored materials, temporary facilities, and clean-up.

J.2.2 When the Work is recommenced after the suspension, the Contractor shall replace or renew any Work damaged during the suspension, remove any materials or facilities used as part of temporary maintenance, and complete the project in every respect as though its prosecution had been continuous and without suspension.

J.3 COMPENSATION FOR SUSPENSION

J.3.1 Depending on the reason for suspension of the Work, the Contractor or the Owner may be due compensation by the other party. If the suspension was required due to acts or omissions of Contractor, the Owner may assess the Contractor actual costs of the suspension in terms of administration, remedial work by the Owner's forces or another contractor to correct the problem associated with the suspension, rent of temporary facilities, and other actual costs related to the suspension. If the suspension was caused by acts or omissions of the Owner, the Contractor shall be due compensation which shall be defined using Section D, Changes in Work. If the suspension was required through no fault of the Contractor or the Owner, neither party owes the other for the impact.

J.4 OWNER'S RIGHT TO TERMINATE CONTRACT

J.4.1 The Owner may, without prejudice to any other right or remedy, and after giving Contractor seven (7) Days' written notice and an opportunity to cure, terminate the Contract in whole or in part under the following conditions:

(a) If Contractor should voluntarily or involuntarily, seek protection under the United States Bankruptcy Code and Contractor as debtor-in-possession or the Trustee for the estate fails to assume the Contract within a reasonable time;

(b) If Contractor should make a general assignment for the benefit of Contractor's creditors;

(c) If a receiver should be appointed on account of Contractor's insolvency;

(d) If Contractor should repeatedly refuse or fail to supply an adequate number of skilled workers or proper materials to carry on the Work as required by the Contract

Documents, or otherwise fail to perform the Work in a timely manner;

(e) If Contractor should repeatedly fail to make prompt payment to Subcontractors or for material or labor, or should disregard laws, ordinances or the instructions of the Owner or its Authorized Representative; or

(f) If Contractor is otherwise in material breach of any part of the Contract.

J.4.2 At any time that any of the above occurs, Owner may exercise all rights and remedies available to Owner at law or in equity, and in addition, Owner may take possession of the premises and of all materials and appliances and finish the Work by whatever method it may deem expedient. In such case, the Contractor shall not be entitled to receive further payment until the Work is completed. If the Owner's cost of finishing the Work exceeds the unpaid balance of the Contract Price, Contractor shall pay the difference to the Owner.

J.5 TERMINATION FOR CONVENIENCE

J.5.1 Owner may terminate the Contract in whole or in part whenever Owner determines that termination of the Contract is in the best interest of the public.

J.5.2 The Owner will provide the Contractor with seven (7) Days' prior written notice of a termination for public convenience. After such notice, the Contractor shall provide the Owner with immediate and peaceful possession of the premises and materials located on and off the premises for which the Contractor received progress payment under Section E. Compensation for Work terminated by the Owner under this provision will be according to Section E. In no circumstance shall Contractor be entitled to lost profits for Work not performed due to termination.

J.6 ACTION UPON TERMINATION

J.6.1 Upon receiving a notice of termination, and except as directed otherwise by the Owner, Contractor shall immediately cease placing further subcontracts or orders for materials, services, or facilities. In addition, Contractor shall terminate all subcontracts or orders to the extent they relate to the Work terminated and, with the prior written approval of the Owner, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts and orders.

J.6.2 As directed by the Owner, Contractor shall upon termination transfer title and deliver to the Owner all Record Documents, information, and other property that, if the Contract had been completed, would have been required to be furnished to the Owner.

SECTION K **CONTRACT CLOSE OUT**

K.1 RECORD DOCUMENTS

As a condition of final payment (refer also to section E.6), Contractor shall comply with the following: Contractor shall provide to Owner's Authorized Representative, Record Documents of the entire project including: three (3) sets of As-Built drawings, and one electronic version, two (2) original O&M Manuals and one electronic version. Record Documents shall depict the project as constructed and shall reflect each and every change, modification, and deletion made during the construction. Record Documents are part of the Work and shall be provided prior to the Owner's issuance of final payment. Record Documents include all modifications to the Contract Documents unless otherwise directed.

K.2 OPERATION AND MAINTENANCE MANUALS

As part of the Work, Contractor shall submit two completed operation and maintenance manuals ("O & M Manuals") for review by the Owner's Authorized Representative prior to submission of any pay request for more than 75% of the Work. No payments beyond 75% will be made by the Owner until the O & M Manuals have been received. The O & M Manuals shall contain all product data as required by the specifications, training information, phone list of consultants, manufacturers, installer and suppliers, manufacturer's printed data, record and shop drawings, schematic diagrams of systems, appropriate equipment indices, warranties and bonds. The Owner's Authorized Representative shall review and return one O & M Manual for any modifications or additions required. Prior to submission of its final pay request, Contractor shall deliver one electronic and two (2) original, complete and approved sets of O & M Manuals to the Owner's Authorized Representative.

K.3 AFFIDAVIT/RELEASE OF LIENS AND CLAIMS

As a condition of final payment, the Contractor shall submit to the Owner's Authorized Representative a notarized affidavit/release of liens and claims form, in a form satisfactory to Owner, which states that all Subcontractors and suppliers have been paid in full, all disputes with property owners have been resolved, all obligations on the project have been satisfied, all monetary claims and indebtedness have been paid, and that, to the best of the Contractor's knowledge, there are no claims of any kind outstanding against the project. The Contractor shall indemnify, defend (with counsel of Owner's choice) and hold harmless the Owner from all claims for labor and materials finished under this Contract. The Contractor shall furnish complete and valid releases or waivers, satisfactory to the Owner, of all liens arising out of or filed in connection with the Work.

K.4 COMPLETION NOTICES

K.4.1 Contractor shall provide Owner notice of both Substantial and Final Completion. The certificate of Substantial Completion shall state the date of Substantial Completion, the responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and the time within which the Contractor shall finish all items on the punch list accompanying the Certificate. Both completion notices must be signed by the Contractor and the Owner to be valid. The Owner shall provide the final signature on the notices. The notices shall take effect on the date they are signed by the Owner.

K.4.2 Substantial Completion of a facility with operating systems (e.g., mechanical, electrical, HVAC) shall be that degree of completion that has provided a minimum of thirty (30) continuous Days of successful, trouble-free operation, which period shall begin after all performance and acceptance testing has been successfully demonstrated to the Owner's Authorized Representative. All equipment contained in the Work, plus all other components necessary to enable the Owner to operate the facility in the manner that was intended, shall be complete on the Substantial Completion date. The Contractor may request that a punch list be prepared by the Owner's Authorized Representative with submission of the request for the Substantial Completion notice.

K.5 TRAINING

As part of the Work, and prior to submission of the request for final payment, the Contractor shall schedule with the Owner's Authorized Representative, training sessions for all equipment and systems, as required in the individual specifications sections. Contractor shall schedule training sessions at least two weeks in advance of the date of training to allow Owner personnel adequate notice.

The O & M Manual shall be used as a basis for training. Training shall be a formal session, held after the equipment and/or system is completely installed and operational in its normal operating environment.

K.6 EXTRA MATERIALS

As part of the Work, Contractor shall provide spare parts, extra maintenance materials, and other materials or products in the quantities specified in the specifications, prior to final payment. Delivery point for extra materials shall be designated by the Owner's Authorized Representative.

K.7 ENVIRONMENTAL CLEAN-UP

As part of the Final Completion notice, or as a separate written notice submitted with or before the notice of Final Completion, the Contractor shall notify the Owner that all environmental pollution clean-up which was performed as a part of this Contract has been disposed of in accordance with all applicable rules, regulations, laws, and statutes of

all agencies having jurisdiction over such environmental pollution. The notice shall reaffirm the indemnification given under Section F.5.1 above.

K.8 CERTIFICATE OF OCCUPANCY

The Contractor shall not be granted Final Completion or receive final payment if the Owner has not received an unconditioned certificate of occupancy from the appropriate state and/or local building officials, unless failure to obtain an unconditional certificate of occupancy is due to the fault or neglect of Owner.

K.9 OTHER CONTRACTOR RESPONSIBILITIES

The Contractor shall be responsible for returning to the Owner all items issued during construction such as keys, security passes, site admittance badges, and all other pertinent items. The Contractor shall be responsible for notifying the appropriate utility companies to transfer utility charges from the Contractor to the Owner. The utility transfer date shall not be before Substantial Completion and may not be until Final Completion, if the Owner does not take beneficial use of the facility and the Contractor's forces continue with the Work.

K.10 SURVIVAL

All warranty and indemnification provisions of this Contract, and all of Contractor's other obligations under this Contract that are not fully performed by the time of Final Completion or termination, shall survive Final Completion or any termination of the Contract

SECTION L
LEGAL RELATIONS & RESPONSIBILITIES

L.1 LAWS TO BE OBSERVED

In compliance with ORS 279C.525, Sections L.2 through L.4 contain lists of federal, state and local agencies of which the Owner has knowledge that have enacted ordinances or regulations relating to environmental pollution and the preservation of natural resources that may affect the performance of the Contract:

L.2 FEDERAL AGENCIES

Agriculture, Department of Forest Service

Soil Conservation Service

Coast Guard

Defense, Department of

Army Corps of Engineers

Energy, Department of

Federal Energy Regulatory Commission

Environmental Protection Agency

Health and Human Services, Department of

Housing and Urban Development, Department of

Solar Energy and Energy Conservation Bank

Interior, Department of

Bureau of Land Management

Bureau of Indian Affairs

Bureau of Mines

Bureau of Reclamation

Geological Survey

Minerals Management Service

U.S. Fish and Wildlife Service

Labor, Department of

Mine Safety and Health Administration

Occupation Safety and Health Administration

Transportation, Department of

Federal Highway Administration

Water Resources Council

L.3 STATE AGENCIES

Administrative Services, Department of

Agriculture, Department of

Soil and Water Conservation Commission

Columbia River Gorge Commission

Energy, Department of

Environmental Quality, Department of

Fish and Wildlife, Department of

Forestry, Department of

Geology and Mineral Industries, Department of

Human Resources, Department of

Consumer and Business Services, Department of
Land Conservation and Development Commission
Parks and Recreation, Department of
State Lands, Division of
Water Resources Department of

L.4 LOCAL AGENCIES

City Councils
County Courts
County Commissioner, Board of
Design Commissions
Historical Preservation Commission
Planning Commissions

SECTION 01010 - SUMMARY OF WORK**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

PROJECT DESCRIPTION

The Project consists of a complete removal of existing siding and trim down to existing sheathing on all exterior walls, demolition and replacement of all windows and coverings, shingle roofing removal and replacement, new gutters and downspouts, new concrete ramps and steps, HVAC upgrades (Alternate bid), and various other repairs and renovations to the District Offices, 88834 Territorial Road, Elmira, Oregon, as shown on Contract Documents prepared by Paul L. Bentley Architect, A.I.A., dated June 2016.

WORK SEQUENCE

The Contract must provide a sequence of operations that will ensure all of the above work can be completed and substantially completed as per Division 0 requirements.

CONTRACTOR USE OF PREMISES

General: During the construction period the Contractor shall have use of the premises for construction operations, including use of the site in the construction area. The Contractor's use of the premises is limited only by the Owner's right to perform operations with its own forces or to employ separate contractors on portions of the project, and by environmental issues.

Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.

Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Staging areas and temporary fencing are shown on the site plan. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site. Access and egress from Territorial Hwy must comply with requirements of the Lane County.

Do not reasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary obtain and pay for such storage off site.

Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave vehicles or equipment unattended with the motor running or ignition key in place.

Secure the site with temporary fencing as required.

OWNER OCCUPANCY

Obtain a Certificate of Occupancy from Lane County Building Official prior to Owner occupancy.

OWNER-FURNISHED ITEMS

The Owner will arrange and pay for delivery of Owner-furnished items in accordance with the Contractor's Construction Schedule, and will inspect deliveries for damage.

If Owner-furnished items are damaged, defective or missing, the Owner will arrange for replacement. The Owner will also arrange for manufacturer's field services, and the delivery of manufacturer's warranties and bonds to the Contractor.

The Contractor is responsible for designating the delivery dates of Owner-furnished items in the Contractor's Construction Schedule and for receiving, unloading and handling Owner-furnished items at the site. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements, and to repair or replace items damaged as a result of his operations. Such items include but are not limited to kitchen appliances, furniture, and equipment.

MISCELLANEOUS PROVISIONS

Before Substantial Completion inspect, test and adjust performance of every system or facility of the Work to ensure that overall performance is in compliance with terms of the Construction Permit.

Submit a report of results to the Owner.

Instruct the Owner's operating personnel on operational requirements needed to maintain compliance.

Report performance of completed installations after adjustments that appear unable to comply with the requirements of the Construction Documents and Permits.

GENERAL:

The work of this Contract includes coordination of the entire work of the project, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activities through project close-out and warranty periods.

MECHANICAL/ELECTRICAL REQUIREMENTS OF GENERAL WORK:

General: Except as otherwise indicated, comply with applicable requirements of Division 15 sections for mechanical provisions within units of general (Divisions 2-14) Work. Except as otherwise indicated, comply with applicable requirements of Division 16 sections for electrical provisions within units of general (Division 2-14) Work.

Service Connections: Refer to Division 15 and Division 16 sections for the characteristics of the mechanical and electrical services to be connected to units of general work. Provide units manufactured or fabricated for proper connection to and utilization of available services, as indicated. Except as otherwise indicated, final connection of mechanical work, and final connection of electrical services to general work is defined as electrical work.

PERFORMANCE REQUIREMENTS FOR COMPLETED WORK:

General:

The Contract Documents indicate the intended occupancy and utilization of the building and its individual systems and facilities. Compliance with governing regulations is intended and required for the work and for the Owner's occupancy and utilization. In addition to the requirement that every element of the work comply with applicable requirements of the contract documents, it is also required that the work as a whole comply with appropriate governing regulations and laws & operate as complete and functional systems.

PART 2 - PRODUCTS (Not applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 01010

SECTION 01026 – UNIT PRICES

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

A unit price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.

Unit prices include all necessary material, overhead, profit and applicable taxes.

Refer to individual Specification Sections for construction activities requiring the establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

Schedule: A "Unit Price Schedule" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials and methods described under each unit price.

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

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

UNIT PRICE SCHEDULE

Item:	Extra/Credit
Replace 2 x 4 wall framing due to dryrot conditions:	_____ per LF of wall
Replace 2 x 10 Rim Joist due to dryrot conditions:	_____ per LF of Joist
Replace 1 x 4 diagonal sheathing due to dryrot:	_____ per SF of Wall/Roof
Replace 2 x 12 fascia board, wrapped in metal:	_____ per LF of fascia

END OF SECTION 01026

SECTION 01027 - APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.

Coordinate the Schedule of Values and Applications for Payment with the Contractor's Construction Schedule, List of Subcontracts.

The Contractor's Construction Schedule is included in Section "Submittals".

SCHEDULE OF VALUES

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

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

- Contractor's construction schedule.
- Application for Payment form.
- List of subcontractors.
- Schedule of Alternates
- List of all products.
- List of all principal suppliers, subcontractors, sub-sub contractors, fabricators.
- Schedule of submittals.

Submit the Schedule of Values to the Owner's Representative at the earliest feasible date, but in no case later than 7 days before the date scheduled for submittal of the initial Application for Payment.

Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.

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

- Project name and location.
- Name of the Architect.
- Project number.
- Contractor's name and address.
- Date of submittal.

Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:

Generic name.
Related Specification Section.
Name of Subcontractor.
Name of Manufacturer or fabricator.
Name of supplier.
Change Orders (numbers) that have affected value.
Dollar value.
Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.

Provide a breakdown of the Contract Sum in complete detail to facilitate public audit of bond funds as required by the Architect, and continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.

Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.

For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

Unit Cost Allowances: Show line item value of unit cost allowances as a product of unit cost times measured quantity as estimated from the best indication in the Contract Documents.

Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete including its total cost and proportionate share of general overhead and profit margin.

At the Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.

Schedule Updating: Update and resubmit the Schedule of Values and time schedule when Change Orders or Construction Change Directives result in a change in the Contract Sum. Each Application for Payment shall be Consistent with previous applications and payments as certified by the Architect and paid for by the Owner. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements. Time schedule shall be updated with each payment application. Weekly updates shall be provided to the Architect, along with copies of the job foreman's daily diaries.

Payment Application Times: Each progress payment date is as indicated in the Agreement. The period of construction Work covered by each Application or Payment is the period indicated in the Agreement.

Payment Application Forms: Use AIA Document G 702 and Continuation Sheets G703 as the form for Application for Payment.

Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.

Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.

Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

Transmittal: Submit 3 executed copies of each Application for Payment to the Owner's Representative by means ensuring receipt within 24 hours; one copy shall be complete, including waivers of lien and similar attachments, when required. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Owner's Representative.

Waivers of Mechanics Lien: With each Application for Payment submit waivers of mechanics liens from subcontractors or sub-subcontractors and suppliers for the construction period covered by the previous application.

Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.

When an application shows completion of an item, submit final or full waivers.

The Owner reserves the right to designate which entities involved in the Work must submit waivers.

Waiver Delays: Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.

Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of Work covered by the application who could lawfully be entitled to a lien.

Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to Owner.

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

PROJECT REQUIREMENTS.

List of subcontractors.

List of principal suppliers and fabricators.

Schedule of Values.

Contractor's Construction Schedule (preliminary if not final). **To be updated weekly with 2 hard copies and e-mailed to Architect.**

Schedule of principal products.

Schedule of unit prices.

Submittal Schedule (To be updated weekly)

RFI Schedule (To be updated weekly)

List of Contractor's staff assignments.

Copies of building permits

Copies of authorizations and licenses from governing authorities for performance of the Work.

- Initial progress report.
- Report of pre-construction meeting.
- Certificates of insurance and insurance policies.
- Performance and payment bonds.
- Proof of prevailing wage payments, certificates and backup data.

Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

Administrative actions and submittals that shall proceed or coincide with this application include:

- Occupancy permits and similar approvals.
- Warranties (guarantees) and maintenance agreements.
- Meter readings.
- Start up performance reports.
- Change-over information related to Owner's occupancy, use, operation, and maintenance.
- Final cleaning.
- Application for reduction of retainage, and consent of surety.
- Advice on shifting insurance coverage's.
- Final progress photographs, digital files.
- Proof of prevailing wage payments, certificates and backup data.
- List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.

Final Payment Application: Administrative actions and submittals, which must precede or coincide with submittal of the final payment Application for Payment include the following:

- Completion of Project closeout requirements.
- Completion of items specified for completion after Substantial Completion.
- Assurance that unsettled claims will be settled.
- Assurance that Work not complete and accepted will be completed without undue delay.
- Transmittal of required Project construction records to Owner.
- Removal of temporary facilities and services.
- Removal of surplus materials, rubbish and similar elements.
- Proof of prevailing wage payments, certificates and backup data.
- Change of door locks to Owner's access.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01027

SECTION 01030 - ALTERNATES**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for Alternates.

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

Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the project.

Notification: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.

Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the Work described under each Alternate.

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

PART 2 - PRODUCTS (Not Applicable).**PART 3 - EXECUTION****SCHEDULE OF ALTERNATES**

ALTERNATE NO. 1: Provide all HVAC upgrades as identified on M-sheets.

ALTERNATE NO. 2: Provide window coverings as per specifications 12494 at all new windows.

ALTERNATE NO. 3: Provide civil work noted as Alternate #3 on Civil Sheets.

END OF SECTION 01030

SECTION 01035 - MODIFICATION PROCEDURES**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to this section.

SUMMARY

This section specifies administrative and procedural requirements for handling and processing Contract modifications.

Related Sections: The following sections contain requirements that relate to this section:

Division 1 Section "Unit Prices" for administrative requirements governing use of unit prices.

Division 1 Section "Submittals" for requirements for the Contractor's Construction Schedule.

Division 1 Section "Application for Payment" for administrative procedures governing applications for payment.

Division 1 Section "Product Substitutions" for administrative procedures for handling requests for substitutions made after award of the Contract.

MINOR CHANGES IN THE WORK

Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Architect on AIA form G710, Architect's Supplemental Instructions.

CHANGE ORDER PROPOSAL REQUESTS

Owner-Initiated Proposal Requests: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.

Proposal requests issued by the Architect are for information only. Do not consider them instruction either to stop work in progress, or to execute the proposed change.

Unless otherwise indicated in the proposal request, within 5 days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change.

Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.

Contractor-Initiated Change Order Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.

Include a statement outlining the 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 Contract Time.

Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

Comply with requirements in Section "Product Substitutions" if the proposed change in the Work requires the substitution of one product or system for a product or system specified.

Proposal Request Form: Use AIA Document G 709 for Change Order Proposal Requests.

CONSTRUCTION CHANGE DIRECTIVE

Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive on AIA Form G714, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

The Construction Change Directive will contain a complete description of the change in the Work and designate the method to be followed to determine change in the Contract Sum or Contract Time.

Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

CHANGE ORDER PROCEDURES

Upon the Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and Contractor on AIA Form G701, as provided in the Conditions of the Contract. Payment for Change Orders will only be made when a Change Order has been signed by all parties.

PART 2 - PRODUCTS (Not Applicable)

PART 3 -EXECUTION (Not Applicable)

END OF SECTION 01035

SECTION 01040 - PROJECT COORDINATION

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:

Coordination.

Administrative and supervisory personnel.

General installation provisions.

Cleaning and protection.

Progress meetings, coordination meetings and pre-installation conferences are included in Section "Project Meetings."

Requirements for the Contractor's Construction Schedule are included in Section "Submittals".

COORDINATION

Coordination: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.

Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

Make adequate provisions to accommodate items scheduled for later installation.

Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

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

Preparation of schedules.
Installation and removal of temporary facilities.
Delivery and processing of submittals.
Progress meetings.
Project Close-out activities.

PART 2 - PRODUCTS (Not Applicable).**PART 3 - EXECUTION****GENERAL INSTALLATION PROVISIONS**

Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

Recheck measurements and dimensions, before starting each installation.

Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated, and to comply with ADA. Refer questionable mounting height decisions to the Architect for final decision.

CLEANING AND PROTECTION

During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

Limiting Exposures: Supervise construction activities to ensure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

- Excessive static or dynamic loading.
- Excessive internal or external pressures.
- Excessively high or low temperatures.
- Thermal shock.
- Excessively high or low humidity.
- Air contamination or pollution.
- Water or ice.
- Solvents.
- Chemicals
- Light.
- Radiation.
- Puncture.
- Abrasion.
- Heavy traffic.
- Soiling, staining and corrosion.
- Bacteria.
- Rodent and insect infestation.
- Combustion.
- Electrical current.
- High speed operation,
- Improper lubrication,
- Unusual wear or other misuse.
- Contact between incompatible materials.
- Destructive testing.
- Misalignment.
- Excessive weathering.
- Unprotected storage.
- Improper shipping or handling.
- Theft.
- Vandalism.

Verify that all drains in the construction area are in working order and notify the Owner of any drains that are plugged, prior to start of work. Where the system becomes plugged during construction, Contractor shall re-open at no additional cost to the Owner.

Debris shall not be allowed to remain on the site or around the building during performance of the work, but shall be disposed of as rapidly as it accumulates.

Do not allow dust, smoke from hot asphalt, or other fumes to enter the building through the air intakes or other openings.

END OF SECTION 01040

SECTION 01045 - CUTTING AND PATCHING**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for cutting and patching.

Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

Requirements of this Section apply to mechanical and electrical installations. Refer to Division-15 and Division-16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

SUBMITTALS

Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.

Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.

List products to be used and firms or entities that will perform Work.

Indicate dates when cutting and patching is to be performed.

List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted, and obtain approval from Director of Maintenance.

Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

QUALITY ASSURANCE

Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

- Foundation construction.
- Bearing walls.
- Structural concrete.
- CMU
- Structural steel.
- Lintels.
- Timber and primary wood framing.
- Miscellaneous structural metals.
- Equipment supports.
- Piping, ductwork, vessels and equipment.

Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

- Shoring, bracing, and sheeting.
- Primary operational systems and equipment.
- Air or smoke barriers.
- Water, moisture, or vapor barriers.
- Membranes and flashings.
- Fire protection systems.
- Noise and vibration control elements and systems.
- Control systems.
- Communication systems.
- Conveying systems.
- Electrical wiring systems.

Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner, as directed by the Architect. All decisions regarding visual satisfaction shall be made solely by the Architect and Contractor hereby agrees to abide by such decision.

If possible retain the original installer or fabricator to cut and patch the following categories of exposed Work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:

- Processed concrete finishes.
- Masonry.
- Matched-veneer woodwork.
- Preformed metal panels.
- Window wall system.
- EFIS, Stucco and ornamental plaster.
- Acoustical ceilings.
- Finished wood flooring.
- Carpeting.

Sheet vinyl and vinyl tile flooring.
Wall covering.
HVAC enclosures, cabinets or covers.

PART 2 - PRODUCTS

MATERIALS

Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

INSPECTION

Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

Before proceeding, meet at the 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.

The Owner, & Architect must approve all cutting at existing prior to cutting.

PREPARATION

Temporary Support: Provide temporary support of Work to be cut.

Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

PERFORMANCE

General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

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Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.

Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.

By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.

Patch and repair floor surface to provide an even surface of uniform height and appearance. Infill concrete floor with concrete at existing trenches.

Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.

CLEANING

Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01045

SECTION 01050 - FIELD ENGINEERING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

General: This Section specifies administrative and procedural requirements for field engineering services, including, but not necessarily limited to, the following:

Land survey Work.

SUBMITTALS

Certificates: Submit a certificate signed by the Land Surveyor or Professional Engineer certifying that the location and elevation of improvements comply with the Contract Documents.

Final Property Survey: Submit 7 copies of the final property survey, including a digital copy in AutoCAD 2000 format.

Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of Sections "Submittals" and "Project Closeout".

QUALITY ASSURANCE

Surveyor: Engage a Registered Land Surveyor registered in the State where the project is located, to perform land-surveying services required.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

EXAMINATION

The Owner will identify existing control points and property line corner stakes.

Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.

Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.

Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.

Establish and maintain a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.

Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

Existing utilities and equipment: 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.

Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer and water service piping.

PERFORMANCE

Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.

Advise entities engaged in construction activities, of marked lines and levels provided for their use.

As construction proceeds, check every major element for line, level and plumb.

Surveyor's Log: Maintain a surveyor's log of control and other survey Work. Make this log available for reference.

Record deviations from required lines and levels, and advise the Architect when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.

On completion of foundation walls, major site improvements, and other Work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles and elevations of construction and sitework.

Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.

Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical Work.

Existing Utilities: Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in, or affected by construction. Coordinate with local authorities having jurisdiction.

Final Property Survey: Before Substantial Completion, prepare a final property survey showing significant features (real property) for the Project. Include on the survey a certification, signed by the Surveyor, to the effect that principal metes, bounds, lines and levels of the Project are accurately positioned as shown on the survey.

END OF SECTION 01050

SECTION 01095 - REFERENCE STANDARDS AND DEFINITIONS**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DEFINITIONS

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

Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help the reader locate the reference; no limitation on location is intended.

Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Architect," "requested by the Architect," and similar phrases.

Approve: The term "approved," where used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in General and Supplementary Conditions.

Regulation: The term "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 the Work.

Furnish: The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."

Install: The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."

Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

Installer: An "Installer" is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or sub-subcontractor, for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform. The term "experienced" when used with term "Installer" means having a minimum of 5 previous Projects similar in size and scope to this Project, being familiar with the precautions required, and having complied with requirements of the authority having jurisdiction & having prequalified as per the Owners requirements.

Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land upon which the Project is to be built.

Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

SPECIFICATION FORMAT AND CONTENT EXPLANATION

Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16-Division format and MASTERFORMAT numbering system.

Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

Abbreviated Language: Language used in Specifications and other Contract Documents is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the full context of the Contract Documents so indicates.

Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.

The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.

INDUSTRY STANDARDS

Applicability of Standards: Except where 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. Such standards are made a part of the Contract Documents by reference.

Publication Dates: Where the date of issue of a referenced standard is not specified, comply with the standard in effect as of date of Contract Documents.

Conflicting Requirements: Where compliance with two or more standards is specified, and the standards establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to the Architect for a decision before proceeding.

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. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.

Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

AA	Aluminum Association 818 Connecticut Avenue, NW Washington, DC 20006
AABC	Associated Air Balance Council 1000 Vermont Avenue, NW Washington, DC 20005
AAMA	Architectural Aluminum Manufacturer's Association 2700 River Rd., Suite 118 Des Plaines, IL 60018
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol St. Washington, DC 20001
AATCC	American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709
ACI	American Concrete Institute P.O. Box 19150, Reford Station Detroit, MI 48219
ADAAG	American with Disabilities Act Accessibility Guidelines for Buildings and Facilities Federal Register Department of Justice
ADC	Air Diffusion Council 230 N. Michigan Ave. Chicago, IL 60601
AGC	Associated General Contractors of America 1957 E. Street, NW Washington, D.C. 20006
AI	Asphalt Institute Asphalt Institute Building College Park, MD 20740
AIA	American Institute of Architects 1735 New York Ave., NW Washington, DC 20006

AIMA	Acoustical and Insulating Materials Association (Successor to AMA and IBI) 205 West Tuohy Avenue, Park Ridge, IL 60068
AISC	American Institute of Steel Construction 400 North Michigan Avenue, 8 th Floor, Washington, D.C. 20036
AISI	American Iron and Steel Institute 1000 16 th Street, NW Washington, D.C. 20036
AITC	American Institute of Timber Constructors 333 W. Hampden Avenue, Englewood, CO 80110
AMCA	Air Movement and Control Association 30 W. University Drive Arlington Heights, IL 60004
ANSI	American National Standards Institute 1430 Broadway New York, NY 10018
APA	The Engineered Wood Association 6807 34 th Avenue, East; Tacoma, WA 98443
APWA.	American Public Works Association 1313 E. 60 th St. Chicago, IL 60637
ARI	Air Conditioning and Refrigeration Institute 1815 North Fort Myer Drive Arlington, VA 22209
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329
ASME	American Society of Mechanical Engineers 345 East 47th St. New York, NY 10017
ASSE	American Society of Sanitary Engineering 960 Illuminating Bldg. Cleveland, OH 44113
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103

AWI	Architectural Woodwork Institute 2310 S. Walter Reed Drive Arlington, VA 22206
AWPI	American Wood Preservers Institute 1651 Old Madow Road, McLean, VA 22090
WPB	American Wood Preservers Bureau 2600 Virginia Avenue, NW Washington, D.C. 20005
AWS	American Welding Society 550 LeJeune Road, NW Miami, FL 33135
AWWA	American Water Works Association 6666 W. Quincy Ave. Denver, CO 80235
BHMA	Builders Hardware Manufacturers Association 60 East 42 nd Street New York, NY 10017
CDA	Copper Development Association 57 th Floor Chrysler Building New York, NY 10174
CISPI	Cast Iron Soil Pipe Institute 2020 "K" Street, NW, Suite 320 Washington, D.C. 20006
CLFMI	Chain Link Fence Manufacturers Institute 1101 Connecticut Avenue, NW Washington, D.C. 20036
CRSI	Concrete Reinforcing Steel Institute 933 Plum Grove Rd. Schaumburg, IL 60195
CSI	Construction Specifications Institute 1150 17 St., Suite 300 Washington, D.C. 20036
Fed. Spec.	Federal Specifications, GSA Business Service Center 909 First Avenue, Seattle, WA 98104
FGMA	Flat Glass Marketing Association White Lakes Professional Bldg. 3310 Harrison Topeka, KS 66611

FM	Factory Mutual System 1151 Boston - Providence Turnpike Norwood, MA 02062
GA	Gypsum Association 1603 Orrington Ave. Evanston, IL 60201
GTA	Glass Tempering Association 3310 Harrison Topeka, KS 66611
HPMA	Hardwood Plywood Manufacturers Association P.O. Box 6246 Arlington, VA 22206
ICBO	International Conference of Building Officials 5360 S. Workman Mill Road Whittier, CA 10017
IEEE	Institute of Electrical and Electronic Engineers 345 E. 47th St. New York, NY 10017
IMIAC	International Masonry Industry All Weather Council International Masonry Institute 815 15 th Street, NW. Washington, D.C. 20005
MFMA	Maple Flooring Manufacturers Association 2400 East Devon, Suite 205 Des Plaines, IL 60018
ML/SFA	Metal Lath/Steel Framing Association 221 North LaSalle St. Chicago, IL 60601
NAAMM	National Association of Architectural Metal Manufacturers 100 S. Marion Street Oak Park, IL 60302
NBHA	National Builders Hardware Association 1290 Avenue of the Americas New York, NY 10019
NBS	National Bureau of Standards, US Dept of Commerce Gaithersburg, MD 20234
NEEB	National Environmental Balancing Bureau 8224 Old Courthouse Road Vienna, VA 22180

NEC	National Electric Code 470 Atlantic Avenue Boston, MA 02210
NECA	National Electrical Contractors Association 7315 Wisconsin Ave. Washington, DC 20014
NEMA	National Electrical Manufacturers Association 2101 L St., NW, Suite 300 Washington, DC 20037
NFPA	National Fire Protection Association 470 Atlantic Avenue Boston, MA 02201
NRCA	National Roofing Contractors Association 1515 N. Harlem Avenue Oak Park, IL 60302
NSWMA	National Solid Waste Management Association 1120 Connecticut Avenue, NW Washington, DC 20036
NTMA	National Terrazzo and Mosaic Association 3166 Des Plaines Ave., Suite 132 Des Plaines, IL 60018
NWMA	National Woodwork Manufacturers Association 400 West Madison Street Chicago, IL 60606
OSHA	Occupational Safety and Health Administration US Dept. of Labor Government Printing Office Washington, DC 20402
OSHD	Oregon State Highway Division 2223 Transportation Building Salem, Oregon 97310
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077
PEI	Porcelain Enamel Institute 1900 L Street NW Washington, DC 20036
S.D.I.	Steel Door Institute 712 Lakewood Center North Cleveland, OH 44107

SIGMA	Sealed Insulating Glass Manufacturers Association 111 E. Wacker Drive Chicago, IL 60601
SJI	Steel Joist Institute 1703 Parham Road, Suite 204 Richmond, VA 23229
SMACNA	Sheet Metal and Air Conditioning Contractors National Association 8224 Old Courthouse Road, Vienna, VA 22180
TCA	Tile Council of America P.O. Box 326 Princeton, NJ 08542
TIMA	Thermal Insulation Manufacturers Association 7 Kirby Plaza Mt. Kisco, NY 10549
UBC	Uniform Building Code as modified and amended by the State of Oregon and Published as the Structural Specialty Code and Fire and Life Safety Regulations.
UL	Underwriters Laboratories 333 Pfingsten Rd. Northbrook, IL 60062
WCLIB	West Coast Lumber Inspection Bureau (grading rules) P.O. Box 25406 Portland, OR 97225
WWPA	Western Wood Products Association 522 SW. 5th Avenue, Yeon Building Portland, OR 97204-2122

Federal Government Agencies: Names and titles of federal government standard- or Specification-producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard-or Specification-producing agencies of the federal government. Names and addresses are subject to change; they are believed to be but are not assured to be accurate and up to date as of the date of the Contract Documents.

CS	Commercial Standard (U.S. Department of Commerce) Government Printing Office Washington, DC 20402
DOC	Department of Commerce 14th St. and Constitution Ave., NW Washington, DC 20230

DOT Department of Transportation
400 Seventh St., SW
Washington, DC 20590

EPA Environmental Protection Agency
401 M St., SW
Washington, DC 20460

Garbage Service:
Sanipac
1650 Glenwood Blvd.
Eugene, OR 97403
541-736-3600

Fire Protection:
Lane Fire Authority
P.O. Box 398
Veneta, OR 97487
541-935-2226

Water: (Veneta Elementary Only)
City of Veneta
88184 8th St.
Veneta, OR 97487
541-935-2191

No Natural Gas Available

Electricity:
Emerald People's Utility District (EPUD)
33733 Seavey Loop Rd.
Eugene, OR 97405
541-746-1583

Planning/Building:
Lane County Management Division
3050 N. Delta Hwy.
Eugene, OR 97408
541-682-3577

Lane County Public Service Building
125 E. 8th Ave.
Eugene, OR 97401
541-682-4011

SUBMITTALS

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01095

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for project meetings including but not limited to:

- Pre-Construction Conference.
- Pre-Installation Conferences.
- Coordination Meetings.
- Progress Meetings.

Construction schedules are specified in another Division-1 Section.

PRE-CONSTRUCTION CONFERENCE

Schedule a pre-construction conference and organizational meeting at the Project site or other convenient location no later than 5 days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.

Attendees: The Owner, Architect and their consultants, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.

Agenda: Discuss items of significance that could affect progress including such topics as:

- Tentative construction schedule.
- Critical Work sequencing.
- Designation of responsible personnel.
- Procedures for processing field decisions and Change Orders.
- Procedures for processing Applications for Payment. Distribution of Contract Documents.
- Submittal of Shop Drawings, Product Data and Samples. Preparation of record documents.
- Use of the premises.
- Office, Work and storage areas.
- Safety Procedures
- First Aid
- Security
- Housekeeping
- Working Hours

PRE-INSTALLATION CONFERENCES

Conduct a pre-installation conference at the site before each construction activity that is required within each specification section, and requires coordination with other construction. The 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 the Architect of scheduled meeting dates.

Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:

- Contract Documents.
- Options.
- Related Change Orders.
- Purchases
- Deliveries.
- Shop Drawings, Product Data and quality control Samples.
- Possible conflicts.
- Compatibility problems.
- Time schedules.
- Weather limitations.
- Manufacturer's recommendations.
- Compatibility of materials.
- Acceptability of substrates.
- Temporary facilities.
- Space and access limitations.
- Governing regulations.
- Safety.
- Inspection and testing requirements.
- Required performance results.
- Recording requirements.
- Protection.

Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.

Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

PROGRESS MEETINGS

Conduct progress meetings at the Project site on Tuesdays (or as agreed) of each week. Notify the Owner and Architect of scheduled meeting dates. Coordinate date of fourth meeting with preparation of the payment request.

Attendees: In addition to representatives of the Owner, Contractor's Superintendent, and Architect, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.

Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind 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. Revise schedule with each month's application for payment as required by Project Manager.

Review the present and future needs of each entity present, including such items as:

- Interface requirements.
- Time.
- Sequences.
- Deliveries.
- Off-site fabrication problems.
- Access.
- Temporary facilities and services.
- Hours of Work.
- Hazards and risks.
- Housekeeping.
- Quality and Work standards.
- Change Orders.
- Documentation of information for payment requests.
- RFI Log

Contractor's Submittal Log & Schedule: Review progress since the last meeting. Determine where each submittal is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind, and location of all submittals.

Contractor's RFI Log: Review progress since the last meeting. Determine where each request for information has been resolved either with additional information, change order, construction change directive, or by other means. Refer to the Contractor's Construction Schedule, whether on time or ahead or behind, and location of all RFI's. See RFI Section 00300 for forms and specific requirements.

Reporting: No later than 3 days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

Additional Meetings: In addition to the meetings described above, the Owner & the Architect reserves the right to call meetings spontaneously when it believes necessary in order to effectively manage work on the Project, to prevent misunderstandings, or to disseminate information.

END OF SECTION 01200

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including;

- Contractor's construction schedule.
- Submittal schedule.
- Shop Drawings.
- Product Data.
- Samples.
- RFI Schedule & Forms

Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

- Permits.
- Applications for payment.
- Performance and payment bonds.
- Insurance certificates.
- List of Subcontractors.
- Prevailing Wage Certificates

The Schedule of Values submittal is included in Section "Applications for Payment."

SUBMITTAL PROCEDURES

Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

All submittals shall be submitted to the Owners Field Representative who shall provide an initial review & either return them to the Contractor for corrections, or sign them and forward them onto the Architect for review.

Allow 14 days for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be delayed for coordination.

If an intermediate submittal is necessary, process the same as the initial submittal.

Allow one week for reprocessing each submittal.

No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing, or to allow timely arrival of products to the jobsite. Many items involve lead time for manufacturing, and it is the Contractors responsibility to ensure all submittals are timely to prevent project delays.

Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.

Include the following information on the label for processing and recording action taken.

Project name.

Date.

Name and address of Architect.

Name and address of Contractor.

Name and address of subcontractor.

Name and address of supplier.

Name of manufacturer.

Number and title of appropriate Specification Section. Drawing number and detail references, as appropriate.

Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect & Owner's Representative using a transmittal form. Submittals received from sources other than the Contractor will be returned without action. Submittals not completely reviewed by Contractor, or incomplete, will be returned without action. Any delay due to such return shall be the responsibility of the Contractor. **If a non-specified item is submitted**, reviewed by Contractor, and submitted to the Owners Representative & Architect, it shall be returned to the Contractor without action. Contractor shall review submittals to ensure completeness, compliance with specifications & contract documents, as well as coordination with other work.

On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

CONTRACTOR'S CONSTRUCTION SCHEDULE

CP Schedule: Prepare a fully developed, "MS Project 98" software schedule. **Submit within 10 days of the date bid is awarded. Submit both hard copy and electronic copy. Update each month with each payment application, and with each change order.**

Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".

Within each time bar indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.

Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.

Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.

Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.

Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

When revisions are made, distribute 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 construction activities.

Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

SUBMITTAL SCHEDULE

After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule.

Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.

Prepare the schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:

Scheduled date for the first submittal.
Related Section number.
Submittal category.
Name of subcontractor.
Description of the part of the Work covered.
Scheduled date for resubmittal
Scheduled date the Architect's final release or approval.

Distribution: Following response to initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

When revisions are made, distribute 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 construction activities.

Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting. Keep a separate log of submittals and update each week for weekly progress meetings. Schedule shall indicate the status of each submittal, & critical dates affected.

DAILY CONSTRUCTION REPORTS

Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Architect at weekly intervals:

List of subcontractors at the site.
Approximate count of personnel at the site.
High and low temperatures, general weather conditions. Accidents and unusual events.
Meetings and significant decisions.
Stoppages, delays, shortages, losses.
Meter readings and similar recordings.
Emergency procedures.
Orders and requests of governing authorities.
Change Orders received, implemented.
Services connected, disconnected.
Equipment or system tests and start-ups.
Partial Completions, occupancies.
Substantial Completions authorized.

SHOP DRAWINGS

Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

Dimensions.

Identification of products and materials included. Compliance with specified standards.

Notation of coordination requirements.

Notation of dimensions established by field measurement.

Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 24" x 36".

Submittal: Submit 6 blue- or black-line prints; 2 prints will be retained; the remainder will be returned.

One of the prints returned shall be marked-up and maintained as a "Record Document".

Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.

Preparation of coordination Drawings is specified in section "Project Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.

Submit coordination Drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

PRODUCT DATA

Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

Manufacturer's printed recommendations.

Compliance with recognized trade association standards. Compliance with recognized testing agency standards. Application of testing agency labels and seals. Notation of dimensions verified by field measurement. Notation of coordination requirements.

Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.

Submittals: Submit 6 copies of each required submittal; submit 7 copies where required for maintenance manuals. The Architect will retain one, and will return the other marked with action taken and corrections or modifications required.

Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.

Do not permit use of unmarked copies of Product Data in connection with construction.

SAMPLES

Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect's Sample. Include the following:

- Generic description of the Sample.
- Sample source.
- Product name or name of manufacturer.
- Compliance with recognized standards.
- Availability and delivery time.

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

Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.

Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.

Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 4 sets; two will be returned marked with the action taken.

Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

Sample sets may be used to obtain final acceptance of the construction associated with each set.

Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

ARCHITECT'S ACTION

Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.

Compliance with specified characteristics is the Contractor's responsibility

Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

Final Unrestricted Release: Where submittals are marked "**Reviewed**," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

Final-But-Restricted Release: When submittals are marked "**Reviewed as Noted**," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

Returned for Resubmittal: When submittal is marked "**Not Approved, Revise and Resubmit**," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.

Do not permit submittals marked "**Not Approved, Revise and Resubmit**" to be used at the Project site, or elsewhere where Work is in progress.

Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 01300

SECTION 01314 – CERTIFICATION OF NO ASBESTOS

TO BE COMPLETED BY THE GENERAL CONTRACTOR

No final payment shall be made until the General Contractor files with the Owner, prior to acceptance of the Work, a notarized Certification of Compliance in the following form.

‘TO THE BEST OF MY KNOWLEDGE, NO ASBESTOS MATERIAL IS USED IN THE CONSTRUCTION OF THIS PROJECT. MATERIAL SAFETY DATA SHEETS WILL BE PROVIDED AS REQUESTED BY THE OWNER FOR ALL MATERIALS WHICH MAY BE QUESTIONED IN THE FUTURE:”

In WITNESS WHEREOF, the undersigned has signed and sealed this instrument this _____ day of _____, 201_.

Firm Name _____

Signature _____

Title _____

Attest _____

Seal

As determined necessary, evidence of compliance may be required to be submitted with and made a part of this certificate.

END OF SECTION 01314

SECTION 01400 - QUALITY CONTROL SERVICES

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for quality control services.

Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Architect. **Quality Control Testing of earthwork, concrete, and steel placement, erection, shall be coordinated by the Contractor and paid for by the owner.**

Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.

Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.

Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.

Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.

Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

RESPONSIBILITIES

Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these services include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.

The Contractor shall employ and pay an independent agency, approved by the Owner, to perform specified quality control services.

The Owner will engage and pay for the services of an independent agency to perform inspections and tests specified as the Owner's responsibility.

Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.

Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.

Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:

Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.

Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.

Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.

Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.

Security and protection of samples and test equipment at the Project site.

Owner Responsibilities: The Owner will provide inspections, tests and similar quality control services specified to be performed by independent agencies and not by the Contractor, except where they are specifically indicated as the Contractor's responsibility or are provided by another identified entity. Costs for these services are not included in the Contract Sum.

The Owner will employ and pay for the services of an independent agency, testing laboratory or other qualified firm to perform services, which are the Owner's responsibility.

Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Architect and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.

The agency shall not perform any duties of the Contractor.

Coordination: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay. In addition the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

SUBMITTALS

The independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test or similar service through the Contractor, in duplicate.

Contractor shall maintain a log of all testing performed and results thereof. Testing Log shall be posted in project office for review at all times. This log shall be updated and distributed at weekly progress meetings.

Submit additional copies of each written report directly to the governing authority, when the authority so directs.

Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:

Date of issue.

Project title and number.

Name, address and telephone number of testing agency. Dates and locations of samples and tests or inspections.

Names of individuals making the inspection or test.

Designation of the Work and test method.

Identification of product and Specification Section. Complete inspection or test data.

Test results and an interpretations of test results. Ambient conditions at the time of sample-taking and testing.

Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.

Name and signature of laboratory inspector.

Recommendations on retesting.

QUALITY ASSURANCE

Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.

Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

REPAIR AND PROTECTION

General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching."

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

Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01400

SECTION 01450 – SAFETY PROCEDURES**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

PRELIMINARY WORK

Prior to the start of and during the course of the Work (above and below ground) the Contractor shall make a thorough survey of the entire work site to determine all potential hazards. Workmen shall be made aware of those hazards and shall be instructed in procedures and the use of equipment for their protection. The Contractor shall verify the location and condition (“live or dead”) of all utilities on and near the work site and take precautions to protect his employees, the general public, and the property

IMMINENT DANGER

The Contractor shall be wholly responsible for any accidents (including death) occurring at any time during the process of the work, and until the final acceptance of the work by the District, which may happen to any of his workmen or those of any Subcontractor employed on the building, or for any damage or injuries (including death) which his work and operations may cause to the work being constructed, or to any occupants of this property, or of the adjoining properties, or to the public, or to any public or private property.

SAFETY

The Contractor shall ensure that all employees, visitors, subcontractors’, employees, and suppliers’ employees, while on the work site, comply with the requirements of OSHA, these requirements and the safety precautions contained in the several Specifications Sections. The Contractor shall promptly and fully comply with, execute, and, without separate charge thereof to the District, shall enforce compliance with the provisions of the Oregon State Employment Act Safety Requirements and Occupational Safety and Health Act requirements.

The Contractor shall immediately advise the District of inspections conducted by OSHA, at the work site, and shall transmit copies of citations and violations to the District.

SAFETY RESPONSIBILITY

Contractor shall be responsible to:

Ensure compliance with these requirements, OSHA requirements, and other safety requirements.

Authorize immediate action to correct substandard safety conditions.

Review and act to ensure compliance with safety procedures with his supervisors, subcontractors, and suppliers.

Make thorough daily safety inspections of the work site and immediately act to eliminate unsafe acts and unsafe conditions.

Investigate worksite accidents and recommend immediate corrective action.

Assist in the preparation of accident investigation and reporting procedures.

Be responsible for the control, availability, and use of safety equipment, including employee personal protective equipment.

REQUEST FOR VARIANCE

Requests for variances to deviate from OSHA requirements must follow the current established procedures by that Agency.

FAILURE TO COMPLY

If the project is shut down due to the Contractor's failure to comply with the requirements of OSHA or other applicable safety requirements, no part of the time loss due to any such suspension of operations or stop orders shall be made the subject of a claim for extension of time or for increased cost or damage by the Contractor.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01450

SECTION 01500 - TEMPORARY FACILITIES

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

Section 01700 Contract Closeout; Final Cleaning

SUMMARY

This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.

Temporary utilities required include but are not limited to:

- Telephone service
- Temporary Electric Power and Light
- Water Service and Distribution
- Storm and Sanitary Sewer

Temporary construction and support facilities required include but are not limited to:

- Temporary Restrooms
- Field offices and storage sheds.
- Temporary enclosures.
- Temporary Project identification signs and bulletin boards.
- Waste disposal services.
- Rodent and pest control.
- Construction aids and miscellaneous services and facilities.
- Temporary heat.
- Temporary roads and paving.
- Sanitary facilities, including drinking water.
- Dewatering facilities and drains.

Security and protection facilities required include but are not limited to:

- Temporary fire protection.
- Barricades, warning signs, lights.
- Environmental protection.
- Temporary Fencing
- Job Cell Phone
- Progress Cleaning
- Temporary Lighting
- Temporary Ventilation

SUBMITTALS

Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work

QUALITY ASSURANCE

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

- Building Code requirements. (Including Oregon Specialty Codes)
- Health and safety regulations.
- Utility company regulations.
- Police, Fire Department and Rescue Squad rules.
- Environmental protection regulations.

Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."

Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.

Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

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

PROJECT CONDITIONS

Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.

Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site. Contractor cannot shut off any utility serving the existing fire station at any time, without having scheduled such shut down 14 days ahead, with approval from fire chief and architect.

PART 2 - PRODUCTS

MATERIALS

General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

Lumber and Plywood: Comply with requirements in Division-6 Section "Rough Carpentry."

For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.

For fences and vision barriers, provide exterior type, minimum 5/8" thick plywood.

Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.

Temporary Construction Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 8-feet high with galvanized barbed wire top strand and galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts and gate posts. Provide gates and hardware as required for access and security. Provide bracing for every 5 sections of fence minimum, or as required to adequately support fence. Comply with appropriate safety regulations for open excavations.

EQUIPMENT

General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 Ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.

Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable finishes. Provide units on foundations adequate for normal loading.

Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. Provide an adequate number of units for all persons and trades employed on Work during construction period. Provide washing facilities in same number as above, to comply with regulations.

First Aid Supplies: Comply with governing regulations, and provide as required for construction personnel.

Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.

Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART 3 - EXECUTION

INSTALLATION

Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

TEMPORARY UTILITY INSTALLATION

General: Consult with the project manager to determine where to tie into existing utilities for temporary use during construction. Where the existing conditions provide only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the owners & utility company's recommendations.

Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.

Use Charges: Cost or use charges for the Contractor will be paid by the Owner for power & water.

Water Service: Use existing water sources as required and coordinate with Owner as required.

Temporary Electric Power Service: Use power as required by Project & acceptable to the Owner.

Temporary Telephones: Provide telephone service for all personnel engaged in construction activities, throughout the construction period. Cellular phones will be allowed for job phones. Contractor shall provide email capabilities on site along with printing.

Temporary Ventilation: Provide temporary fans as required to maintain clean air for construction operations. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, and gasses

Temporary Fire Protection: Take all precautions to prevent possibility of fire resulting from construction operations. Particularly avoid hazardous accumulations of rubbish and unsecured flammable materials.

Provide emergency fire extinguishing equipment of adequate type and quantity, readily available and properly maintained.

Keep local fire departments telephone number prominently displayed near telephones.

TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access.

Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for progress meetings.

Prevailing wage rates, OSHA regulations, Hazardous Communications, and permits must all be posted for viewing.

The above office shall be completed in total and fully operational for use by the Owners Representative and the Architect not later than 10 (ten) days after mobilization by the General Contractor.

Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.

Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.

Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

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

Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat.

Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.

Close openings through floor or roof decks and horizontal surfaces with load-bearing steel-framed construction.

Contractor must clean all areas used for access on a daily basis, and must keep all such areas reasonably clean throughout the day.

Contractor must attempt to restrict noisy demolition work & other noise generating types of work to scheduled and agreed times, or prior to 8am or after 3:30 pm, if not scheduled in advance.

Temporary Signs: Prepare signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs. No advertising signs for subcontractors are allowed.

Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

Project Sign:

Provide (1) 8' x 8' project signs on temporary supports of ptdf framing designed to withstand wind loads and vandalism. Sign will involve colors, logos, etc. Erect on sign near construction entrance, at a location approved by the owner.

Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

SECURITY AND PROTECTION FACILITIES INSTALLATION

Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.

Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply With NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."

Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

Store combustible materials in containers in fire-safe locations.

Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.

Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.

Provide barriers to prevent unauthorized entry to construction. (See site plan)

Provide barriers to protect adjacent properties from damage from construction operations.

Protect non-owned vehicular traffic, stored materials, site and structures from damage.

Provide barricades required by governing authorities in public rights of way.

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

Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment, which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

Water Control:

Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

Exercise care in cleaning out equipment, etc., so as to prevent materials from clogging catch basins and yard drains.

Leave all drainage items clean and in proper working condition at all times.

Comply with Lane County requirements.

Dust Control:

Vacuum clean interior surfaces of building prior to start of finish paint.

Continue vacuum cleaning on an as needed basis until building is ready for Substantial Completion or occupancy.

Comply with Lane County requirements.

Pollution Control

Burning or burying of rubbish and waste material on Site is prohibited. Provide dump boxes for collection of waste, as required for all trades. Dump boxes as they become full on an as needed basis. Do not allow waste to overflow and accumulate.

Disposal of volatile fluid wastes (such as mineral spirits, or paint thinner) in storm or sanitary sewer systems is prohibited.

Keep site and surrounding areas clear of accumulations of waste material and rubbish resulting from operations under this Contract. Remove waste from Site immediately upon completion of work.

Comply with Lane County requirements.

Exterior Enclosures:

Provide temporary weather-tight closures of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

Protection of Installed Work

Protect installed work and provide special protection where specified in individual specification Sections.

Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

Provide and maintain temporary shoring and lateral bracing of structure during erection to resist all loads including:

Wind, Seismic, Construction, Materials, Moving Equipment

Do not remove temporary bracing and shoring until adequate permanent connections or structural elements are in final position and positively anchored.

Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

Protect finished floors, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects by protecting with durable sheet materials.

Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from weatherproofing or roofing material manufacturer.

Security:

Provide security and facilities as necessary to protect Work, from unauthorized entry, vandalism, or theft.

Progress Cleaning:

Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition

Remove debris and rubbish from pipe chases, plenums, attics, and other enclosed or remote spaces prior to enclosing space.

Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

Remove waste material, debris, and rubbish from site on regular basis, as required and dispose of off site.

Parking:

Provide and arrange for temporary parking areas to accommodate construction personnel and project visitors.

OPERATION, TERMINATION AND REMOVAL

Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.

Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when 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 the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.

At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:

Replace air filters and clean inside of ductwork and housings.

Replace significantly worn parts and parts that have been subject to unusual operating conditions.

Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

Clean and repair damage caused by installation or use of temporary work.

Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

END OF SECTION 01500

SECTION 01600 - MATERIALS AND EQUIPMENT

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."

Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.

Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section "Product Substitutions."

When the price, fitness, availability, and quality of two materials or products are equal, as judged by the Architect, select the material or product, which has been manufactured in the State of Oregon.

DEFINITIONS

Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.

"Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

"Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturers published product literature that is current as of the date of the Contract Documents.

"Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

"Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

QUALITY ASSURANCE

Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

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

Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products, which will be exposed to view in occupied spaces, or on the exterior.

Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.

Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface, which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

Name of product and manufacturer.
Model and serial number.
Capacity.
Speed.
Ratings.

PRODUCT DELIVERY, STORAGE, AND HANDLING

Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

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.

Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.

Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

PRODUCT SELECTION

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

Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.

Semiproprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.

Where products or manufacturers are specified by name, accompanied by the term "or equal," or "or approved equal" comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product. Approval must be obtained prior to bidding, in a timely manner to allow for addenda. Architect will make final decisions regarding timing issues relative to Addenda preparation and all decisions will be final. Substitutions may be returned without action if submittal is incomplete, received too late, or if requested after bid opening.

Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.

Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.

Visual Selection: Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern and texture from the product line selected.

PART 3 - EXECUTION

INSTALLATION OF PRODUCTS:

Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

STARTING SYSTEMS

Coordinate schedule for start-up of various equipment and systems.

Notify Architect and Project Manager seven days prior to start up.

Verify that each piece of equipment or system has been checked for proper lubrication; drive rotation, belt tension, control sequence, or other conditions, which may cause damage.

Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

Verify wiring and supporting components for equipment are complete and tested.

Execute start-up under supervision of responsible manufacturer's representative or Contractor's personnel in accordance with manufacturer's instructions.

When specified in individual specifications Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start up, and to supervise placing equipment or system in operation.

Submit a written report in accordance with Section 01400 that equipment or system has been properly installed and is functioning correctly.

DEMONSTRATION AND INSTRUCTIONS:

Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of final inspection.

For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

Utilize operation and maintenance manuals as basis for instruction, review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at scheduled times, at equipment location.

Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during installation.

END OF SECTION 01600

SECTION 01631 - PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for handling requests for substitutions made prior to award of the Contract.

Substitutions after Bid award will not be considered, except as specifically provided within this Section. The Contractor's Construction Schedule is included under Section "Submittals."

Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.

DEFINITIONS

Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.

Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Bidder prior to award of the Contract are considered requests for "substitutions." The following are not considered substitutions:

Revisions to Contract Documents requested by the Owner or Architect.

Specified options of products and construction methods included in Contract Documents.

The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

SUBMITTALS

Substitution Request Submittal: Requests for substitution will be considered if received 10 days prior to Bid Opening. Requests received less than 10 days prior to the Bid Opening may be considered or rejected at the discretion of the District.

Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.

Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

Product Data, including Drawings and descriptions of products, fabrication and installation procedures.

Samples, where applicable or requested.

A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.

Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors that will become necessary to accommodate the proposed substitution.

A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.

Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

A detailed written description, of the manufacturer's certification program and the requirements thereof, including a current listing of approved contractors. Substitutions will not be approved unless a qualified bidder is on the manufacturers approved contractor listing. The District will use the certification data as a key element in the approval process.

Architect's Action: Within two days of receipt of the request for substitution, the Architect will request additional information or documentation necessary for evaluation of the request. Within 5 days of receipt of the request, or one week of receipt of the additional information or documentation, whichever is later, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, the product will not be approved.

PART 2 - PRODUCTS

REQUESTS FOR SUBSTITUTIONS

Conditions: The Bidders substitution request will be received and considered by the Architect when all of the following conditions are satisfied, as determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.

Extensive revisions to Contract Documents are not required.

Proposed changes are in keeping with the general intent of Contract Documents.

The request is timely, fully documented and properly submitted.

The request is directly related to an "or equal" clause or similar language in the Contract Documents.

The proposed substitution must provide ICBO #, if applicable, for review.

The proposed substitution must provide an installation of the exact system requested for approval, within 100 miles, at least 5 years old, for inspection by the owner.

Submit requests for substitutions under provisions of Instructions to Bidders.

Submit separate requests for each substitution. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents.

Identify product by Specifications section and Article Numbers. Provide manufacturers name and address, trade name of product, and model or catalog number. List fabricators and suppliers as appropriate.

Attach product data as specified in Section 01300.

List similar projects using product, dates of installation, and names of Architects and Owner.

Give itemized comparison of proposed substitution between proposed substitution and the specified product.

Give cost data comparing proposed substitution with specified product, and amount of net change to contracts um.

List availability of maintenance services and replacement materials.

State effect of substitution on construction schedule, and changes required in other work or products.

The Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

Manufacturer's certification & approval program of Contractors to install products.

Items which are scheduled to be donated entirely, or partially from one of the project donors, are items for which substitutions may not be considered.

REQUESTS FOR SUBSTITUTIONS AFTER AWARD OF CONTRACT

Substitutions will normally not be considered after award of contract except when required due to unforeseen circumstances. Within a period of 21 days after date of Contract, the Architect may at his option, consider formal written requests for substitution of products in place of those specified when submitted according to the requirements stipulated herein. To receive consideration, one or more of the following conditions must be documented in any such request:

The substitution is required for compliance with final interpretation of Code requirements or insurance regulations.

The substitution is required due to unavailability of a specified product, through no fault of Contractor.

The substitution is required because subsequent information disclosed the inability of the specified project to perform properly or to fit in the designated space.

The substitution is required because it has become clearly evident, in the judgment of the Owner/Architect that substitution would be substantially in the best interest of the Owner in terms of cost, time or other considerations.

Submit with each request all submittals required under paragraph "Requests for Substitutions

SUBSTITUTION REQUEST FORM

Requests for approval of unspecified items will be considered only if submitted on the Substitution Request form bound in the project manual or a duplicate copy thereof. A separate form shall be submitted for each item upon which approval is requested, with the exception of groups of items (e.g. electrical fixtures, plumbing fixtures, etc) for which an itemized list may be attached.

Request for mechanical and or electrical items may be submitted directly to the consulting engineer, with a copy to the Architect.

CONTRACTOR REPRESENTATION

Requests for substitutions constitute a representation that the Contractor:

Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified product.

Will provide the same warranty for the Substitution as for the specified product.

Will coordinate the installation and make changes to other Work, which may be required for the Work to be complete with no additional cost to Owner.

Waives claims for additional costs or time extensions, which may subsequently become apparent.

Will reimburse Owner for review or re-design services associated with re-approval by authorities.

PART 3 - EXECUTION (Not Applicable)

The architect is the sole judge of acceptability of proposed substitutions. Only accepted substitutions will be permitted in Work. Substitution acceptance does not relieve Contractor from responsibility for proper execution of work and compliance with other Contract requirements. Contractor agrees to abide by the decision of the Architect with regards to substitution requests as being a final decision.

END OF SECTION 01631

DOCUMENT 01631
SUBSTITUTION REQUEST FORM

TO: Paul L. Bentley Architect AIA PC
615 S.E. Jackson Street
Roseburg, Oregon 97470

PROJECT: **FERN RIDGE SCHOOL DISTRICT 2016**

We hereby submit for your consideration the Product described below as a substitute for the specified product indicated. We have read and understand Specifications Section 01631 Product Substitutions and are providing all required data for your consideration. And are complying with all requirements of said section. If we have not included all data as per Section 01631, or are not in compliance therewith, we understand that you may at your discretion, reject this request without further review. We further understand that architects decision to accept, reject, or request additional information shall be final and agree to abide by such decision.

1. Specified Product:

Name: _____

Section: _____ Page #: _____

2. Proposed Substitution:

a. Brand Name: _____

b. Model/Catalog No.: _____

c. Manufacturer: _____

Address: _____

Phone & Fax: _____

d. Nearest Distributor: _____

3. Submitted by: Name: _____

Company: _____

Phone & Fax: _____

Signature & agreement to above terms: _____

Supporting Data: Provide and attach data including product description, specifications, drawings, performance and test data adequate for evaluation of the request, changes required to other portions of the contract documents due to substitution, and **all other data required as per Section 01631.**

_____ Approved _____ Approved as noted

_____ Not Approved Comments: _____

_____ Not Approved, Received too Late

By: _____

SECTION 01700 - PROJECT CLOSEOUT

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

- Inspection procedures.
 - Project record document submittal.
 - Operating and maintenance manual submittal.
 - Submittal of warranties.
 - Final cleaning.
- Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions-2 through -16.

SUBSTANTIAL COMPLETION

Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following.

List exceptions in the request.

In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.

Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

Advise Owner of pending insurance change-over requirements.

Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.

Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.

Deliver tools, spare parts, extra stock, and similar items.

Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.

Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.

The Architect will repeat inspection when requested and assured that the Work has been substantially completed.

Results of the completed inspection will form the basis of requirements for final acceptance.

FINAL ACCEPTANCE

Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following.

List exceptions in the request.

Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.

Submit an updated final statement, accounting for final additional changes to the Contract Sum.

Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.

Submit consent of surety to final payment.

Submit evidence of final, continuing insurance coverage complying with insurance requirements.

Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.

Upon completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

Should additional inspections (i.e. more than one reinspection for any item or portion of work) be required before the Work is accepted, the cost for each additional reinspection will be charged to the Owner at the Architects hourly rate. The Owner shall have the right to deduct such charges from the contract amount as provided in the Conditions of the Contract

RECORD DOCUMENT SUBMITTALS

General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.

Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.

Note related Change Order numbers where applicable.

Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.

Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work, which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

Upon completion of mark-up, submit complete set of record Product Data to the Architect for the Owner's records.

Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.

Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner's records.

Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded

sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

- Emergency instructions.
- Spare parts list.
- Copies of warranties.
- Wiring diagrams.
- Recommended "turn around" cycles.
- Inspection procedures.
- Shop Drawings and Product Data.
- Fixture lamping schedule.

Provide the Owner with 4 binders of the above items, and organize as follows:

Prepare binder covers with printed title "OPERATIONS AND MAINTENANCE INSTRUCTIONS", title of the project, and subject matter of binder when multiple binders are required.

Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

Contents: Prepare a table of contents for each volume, with each Product or system description identified.

Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.

Part 2: Operation and maintenance instructions arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractor's, and suppliers. Identify the following:

- Significant design criteria.
- List of equipment.
- Parts list for each component
- Operating instructions
- Maintenance instructions for equipment and systems.
- Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.

Part 3: Project documents and certificates, including the following:

- Shop drawings and product data
- Air and water balance reports
- Certificates
- Photocopies of warranties and bonds.

Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned with Architects comments. Revise content of documents as required prior to final submittal.

Submit final volumes, revised, within ten days after final inspection.

WARRANTIES

Provide notarized copies.
Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
Provide table of Contents and assemble in three D size ring binder with durable plastic cover.

PROJECT CLOSEOUT 01700-4

Submit prior to final application for payment.

For items of work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

SPARE PARTS AND MAINTENANCE MATERIALS

Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.

Deliver to location as directed, obtain receipt prior to final payment.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

CLOSEOUT PROCEDURES

Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

- Maintenance manuals.
- Record documents.
- Spare parts and materials.
- Tools.
- Lubricants.
- Fuels.
- Identification systems.
- Control sequences.
- Hazards.
- Cleaning.
- Warranties and bonds.
- Maintenance agreements and similar continuing commitments.

As part of instruction for operating equipment, demonstrate the following procedures:

- Start-up.
- Shutdown.
- Emergency operations.
- Noise and vibration adjustments.
- Safety procedures.
- Economy and efficiency adjustments.
- Effective energy utilization.

FINAL CLEANING

General: General cleaning during construction is required by the General Conditions.

Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program.

Comply with manufacturer's instructions.

Remove labels that are not permanent labels.
Clean transparent materials, including mirrors and glass in doors and windows.
Remove glazing compound and other substances that are noticeable vision-obscuring materials.
Replace chipped or broken glass and other damaged transparent materials.
Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances.
Restore reflective surfaces to their original reflective condition.
Leave concrete floors broom clean.
Vacuum carpeted surfaces.
Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances.
Clean plumbing fixtures to a sanitary condition.
Clean light fixtures and lamps.
Clean the site, including landscape development areas, of rubbish, litter and other foreign substances.
Sweep paved areas broom clean; remove stains, spills and other foreign deposits.
Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

Pest Control:

Engage an experienced exterminator to make a final inspection, and rid the Project of rodents, insects, and other pests.

Removal of Protection:

Remove temporary protection and facilities installed for protection of the Work during construction.

Compliance:

Comply with regulations of authorities having jurisdiction and safety standards for cleaning.
Do not burn waste materials.
Do not bury debris or excess materials on the Owner's property.
Do not discharge volatile, harmful or dangerous materials into drainage systems.
Remove waste materials from the site and dispose of in a lawful manner.
Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.
Provide occupancy permit from the Douglas County Building Department.
Provide recorded survey showing all improvements as installed.

END OF SECTION 01700

SECTION 01740 - WARRANTIES AND BONDS**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.

General closeout requirements are included in Section "Project Closeout."

Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Divisions-2 through -16 or on drawings.

Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

DEFINITIONS

Standard Product Warranties are preprinted warranties published by individual manufacturer's for particular products and are specifically endorsed by the manufacturer to the Owner.

Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

WARRANTY REQUIREMENTS

Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

SUBMITTALS

Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.

Refer to individual Sections of Divisions-2 through -16 for specific content requirements, and particular requirements for submittal of special warranties.

Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.

Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the 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 the installer.

Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS, the Project title or name, and the name of the Contractor.

When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (not applicable).

PART 3 - EXECUTION (not applicable).

END OF SECTION 01740

SECTION 02070 - SELECTIVE DEMOLITION

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

SUMMARY

This Section requires the selective removal and subsequent offsite disposal of the following:

Portions of existing building indicated on drawings and as required to accommodate new construction.

Removal of doors and frames indicated "remove" or as required for new work.

Removal of existing windows indicated to be removed and as detailed or necessary for new window system installation.

Removal and protection of existing fixtures, materials, and equipment items as indicated or as required by new work.

Removal of existing floor coverings & base as noted on drawings, without damaging surfaces to remain.

Removal of wood trim, etc as required for installation of new window systems. Removal of infill panels as required where new window system is noted to be installed including interior and exterior infill panels, and window coverings.

Removal of siding at rooftop mechanical penthouse, and all upper walls and all clerestory areas. This shall include existing siding material along with all previous sidings below down to existing wall sheathing.

Removal of site improvements as per site documents, including asphalt paving as required for drainage improvements or for septic work.

Removal of existing window coverings and tracks and attachments, for new window coverings.

Removal of siding, trim, both vinyl and original wood, metal wraps, etc.

Related work specified elsewhere:

Remodeling construction work and patching are included within the respective sections of specifications, including removal of materials for reuse and incorporation into remodeling or new construction.

Relocation of pipes, conduits, ducts, and other mechanical and electrical work is specified in other Divisions.

DEFINITIONS

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

Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

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

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.

MATERIALS OWNERSHIP

Unless otherwise indicated, demolition waste becomes property of Contractor.

Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

Carefully salvage in a manner to prevent damage and promptly return to Owner.

PREINSTALLATION MEETINGS

Predemolition Conference: Conduct conference at Project site.

Inspect and discuss condition of construction to be selectively demolished.

Review structural load limitations of existing structure.

Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

Review areas where existing construction is to remain and requires protection.

SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Schedule indicating proposed sequence of operations for selective demolition work to Owner's Representative for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.

Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations. This work shall be coordinated with project manager prior to April 1, 2013 to ensure ability to complete all work over the summer vacation schedule and to allow for any demolition work that may be approved during spring break vacation.

Photographs of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with Owner's Representative prior to start of work. Submit photos on a CD.

INFORMATIONAL SUBMITTALS

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.

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. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

Predemolition Photographs: Submit before Work begins.

CLOSEOUT SUBMITTALS

Inventory: Submit a list of items that have been removed and salvaged.

Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

JOB CONDITIONS

Occupancy: Owner will occupy portions of the building immediately adjacent to areas of selective demolition until summer vacation begins. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities that will affect Owner's normal operations if occurring prior to summer vacation and approved by owner.

Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.

Conditions existing at time of inspection for bidding purposes will be maintained by Owner insofar as practicable. However, minor variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.

Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

Storage or sale of removed items on site will not be permitted.

Protections: Provide temporary barricades and other forms of protection to protect Owner's personnel and general public from injury due to selective demolition work.

Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to occupied portions of building.

Erect temporary covered passageways as required by authorities having jurisdiction.

Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent facilities or work to remain.

Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

Protect floors with suitable coverings as necessary as well as any finishes to remain.

Construct temporary insulated dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks.

Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building. Provide security as required for demolition that may leave the building vulnerable to theft.

Remove protections at completion of work.

Damages: Promptly repair damages caused to adjacent facilities by demolition work and repair as required at not expense to the owner.

Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.

Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.

Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

Maintain fire protection services during selective demolition operations.

Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.

Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

Hazardous Materials:**Asbestos:**

During the execution of this contract it is possible that asbestos containing materials could be encountered while working in and around District buildings and property. A District ASBESTOS CONTAINING MATERIALS NOTIFICATION STATEMENT FOR CONTRACTORS form must be completed and signed by the contractor prior to beginning any work in any Fern Ridge School District building.

The presence of known and assumed asbestos containing materials are documented in the AHERA Management Plan for each building. Copies of the AHERA Management Plan are available in the main office of each building and in the maintenance offices. The AHERA Management must be informed of the contractor's activities in each building prior to the start of the work so they can inform the Contractor how to use the AHERA Management Plan and to determine if any asbestos containing material may be impacted by the Contractor. Please allow this to serve as official notice that is your responsibility as a contractor when performing work or hiring subcontractors to perform work on District property to verify the presence or absence of asbestos in the areas in which your work will be performed.

The Contractor shall not disturb known or assumed asbestos containing materials. If the Contractor discovers suspect asbestos containing materials that have not been identified, they must stop work and notify, AHERA Program Manager, so the material can be sampled. Any asbestos containing materials that must be removed to allow the Contractor to complete contracted work will be removed under separate contract by the District. IF the Contractor disturbs asbestos containing materials identified in the buildings AHERA Management Plan, they will be responsible for the cost of cleanup and decontamination.

The Districts abatement contractor will remove asbestos-containing plaster where identified on the drawings. General Contractor is to clearly mark asbestos-containing plaster surfaces to be removed or drilled prior to the start of abatement. Either before or after the abatement phase, all demolition and installation work performed by the General Contractor that will disturb identified asbestos-containing building materials is the responsibility of the General Contractor. It is the General Contractor's responsibility to hire a certified asbestos abatement contractor to conduct the planning and work on asbestos-containing building materials, unless the General Contractor holds required certifications for asbestos work. Any persons planning or performing work on asbestos-containing building materials must be properly certified in the State of Oregon (Asbestos Work, AHERA Project Designer, etc.)

Fern Ridge School District will abate, under separate contract prior to or concurrent with the work of this contract, materials that will be impacted by the work and that contain at least 1% asbestos. Materials containing less than 1% asbestos will not be abated by the School District.

The Districts abatement contractor will remove asbestos-containing plaster where identified in the report. General Contractor is to clearly mark asbestos-containing plaster surfaces to be removed or drilled prior to the start of abatement. Either before or after the abatement phase, all demolition and installation work performed by the General Contractor that will disturb identified asbestos-containing building materials is the responsibility of the General Contractor. It is the General Contractor's responsibility to hire a certified asbestos abatement contractor to conduct the planning and work on asbestos-containing building materials, unless the General Contractor holds required certifications for asbestos work. Any persons planning or performing work on asbestos-containing building materials must be properly certified in the state of Oregon (Asbestos Work, AHERA Project Designer, etc.)

Lead:

Due to the age of these buildings, painted surfaces should be assumed to contain lead. Contractor is responsible to conform with all applicable State and Federal environmental regulations related to the disruption, removal and disposal of hazardous materials.

Repair, Renovation, or Painting work being performed in "Child-Occupied Facilities" (facilities built prior to 1978 where children under the age of six regularly spend time) must be conducted by a "certified renovation firm" utilizing a "certified renovator".

For Renovation, Repair, and Painting work in Child-Occupied areas that are identified within in this document, the successful bidder will be responsible for compliance with all requirements of proposed OAR 333-70-0075 through 333-070-0160 (at <http://oregon.gov/DHS/ph/leadpaint/docs/proposedtext.pdf>) when conducting work within identified DDSD Child-Occupied areas. Proof of certifications to perform Renovation work in Child-Occupied areas will be prerequisite to final contract approval.

PART 2 - PRODUCTS PERFORMANCE REQUIREMENTS

Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

Security: Provide 24 hour security to guard against vandalism.

PART 3 - EXECUTION

PREPARATION

General: Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be demolished and adjacent facilities to remain.

Cease operations and notify Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

Cover and protect furniture, equipment, and fixtures from soilage or damage when demolition work is performed in areas where such items have not been removed.

Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.

Provide weatherproof closures for exterior openings resulting from demolition work.

Provide complete dustproof protection during concrete grinding and polishing operations for all finishes to remain including preventing dust from entering fan coil units and all cabinets.

Locate, identify, stub off, and disconnect utility services that are not indicated to remain.

Provide bypass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shutdown of service is necessary during changeover.

DEMOLITION

SELECTIVE DEMOLITION 02070-6

General: 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:

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.

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.

Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

Maintain adequate ventilation when using cutting torches.

Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

Dispose of demolished items and materials promptly.

Where demolition includes removing ceiling tiles or other finish materials that will be required to patch surfaces, use care to remove and maintain usability.

SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." **Do not use methods requiring solvent-based adhesive strippers.**

SALVAGED MATERIALS

Salvaged Items: Where indicated on Drawings as "Salvage -Deliver to Owner," carefully remove indicated items, clean, store, and turn over to Owner and obtain receipt.

Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance, remain property of Owner. Notify Owner's Representative if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

Carefully remove, clean, and deliver to Owner the following items:

DISPOSAL OF DEMOLISHED MATERIALS

Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.

If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

Burning of removed materials is not permitted on project site.

CLEANUP AND REPAIR

General: Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.

Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02070

SECTION 06100 - ROUGH CARPENTRY FOR ARCHITECTURAL WORK**PART 1 - GENERAL****RELATED DOCUMENTS:**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

SUMMARY

Types of work in this section include rough carpentry for:

Wood grounds, nailers, and blocking.

Finish carpentry is specified in another section within Division 6.

DEFINITIONS:

Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated.

SUBMITTALS:

Material Certificates: Where dimensional lumber is provided to comply with minimum allowable unit stresses, submit listing of species and grade selected for each use, and submit evidence of compliance with specified requirements. Compliance may be in form of a signed copy of applicable portion of lumber producer's grading rules showing design values for selected species and grade. Design values shall be as approved by the Board of Review of American Lumber Standards Committee.

Wood Treatment Data: Submit chemical treatment manufacturer's instructions for proper use of each type of treated material.

Preservative Treatment: For each type specified, include certification by treating plant stating type of preservative retained and conformance with applicable standards.

For water-borne treatment, include statement that moisture content of treated materials was reduced to levels indicated prior to shipment to project site.

PRODUCT HANDLING:

Delivery and Storage: Keep materials dry at all times. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.

For lumber and plywood pressure treated with waterborne chemicals, sticker between each course to provide air circulation.

PROJECT CONDITIONS:

Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow attachment of other work.

PART 2 - PRODUCTS**LUMBER, GENERAL:**

Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:

WCLIB - West Coast Lumber Inspection Bureau.

WWPA - Western Wood Products Association.

Grade Stamps: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

For exposed lumber apply grade stamps to ends or back of each piece, or omit grade stamps entirely and issue certificate of grade compliance from inspection agency in lieu of grade stamp.

Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.

Provide dressed lumber, S4S, unless otherwise indicated.

Provide seasoned lumber with 19 percent maximum moisture content at time of dressing shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.

DIMENSION LUMBER:

For light framing (2" to 4" thick, 2" to 4" wide), provide the following grade and species:

No. 2 grade.

Species: Douglas fir, Larch, except as otherwise noted.

For structural light framing (2" to 4" thick, 2" to 4" wide), provide the following grade and species:

No. 2 grade.

Same species as indicated above.

For structural framing (2" to 4" thick, 5" and wider), provide the following grade and species:

Select: No. 2 U.N.O.

Species: Douglas fir or Douglas-Fir-Larch graded, respectively, under WCLIB or WWPA rules.

Fb (minimum extreme fiber stress in bending); 1500 psi.

E (minimum modulus of elasticity); 1,700,000 psi.

MISCELLANEOUS LUMBER:

Provide wood for support or attachment of other work including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping and similar members. Provide lumber of sizes indicated, worked into shapes shown, and as follows:

Moisture content: 19 percent maximum for lumber items not specified receive wood preservative treatment.

Grade: Construction Grade light framing size lumber of any species or board size lumber as required. No. 2 Common or Standard grade boards per WCLIB or WWPA rules.

MISCELLANEOUS MATERIALS:

Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.

Where rough carpentry work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A 153).

Building Paper: See Division 7, Section 72500 Weather Barriers

Air Infiltration Barrier: See Division 7, Section 72500 Weather Barriers

Sill Sealer Gaskets: Glass fiber resilient insulation fabricated in strip form for use as a sill sealer; 1" nominal thickness compressible to 1/32"; selected from manufacturer's standard widths to suit width of sill members indicated; in rolls of 50' or 100' in length.

WOOD TREATMENT BY PRESSURE PROCESS:

Preservative Treatment: Where lumber or plywood is indicated as "Trt-Wd" or "Treated," or is specified herein to be treated, comply with applicable requirements of AWPB Standards C2 (Lumber) and C9 (Plywood) and of AWPB Standards listed below. Mark each treated item with the AWPB Quality Mark Requirements.

Pressure-treat above-ground items with water-borne preservatives complying with AWPB LP-2. After treatment, kiln-dry to a maximum moisture content, respectively of 19 percent and 15 percent. Treat indicated items and the following:

Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.

Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.

Wood floor plates installed over concrete slabs directly in contact with earth.

PART 3 - EXECUTION**INSTALLATION, GENERAL:**

Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.

Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.

Countersink nail heads on exposed carpentry work and fill holes.

Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

WOOD GROUNDS, NAILERS, BLOCKING AND SLEEPERS:

Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

Provide permanent grounds of dressed, preservative treated, key-bevelled lumber not less than 1-1/2" wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

WOOD FURRING:

Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finished work.

WOOD FRAMING, GENERAL:

Provide framing members of sizes and on spacings shown, and frame openings as shown, or if not shown, comply with recommendations of "Manual for House Framing" of National Forest Products Association N.F.P.A). Do not splice structural members between supports.

Anchor and nail as shown, and to comply with "Recommended Nailing Schedule" of "Manual for House Framing" and "National Design Specifications for Wood Construction" published by of N.F.P.A.

Firestop concealed spaces of wood framed walls and partitions at each floor level and at the ceiling line of the top story. Where firestops are not automatically provided by the framing system used, use closely-fitted wood blocks of nominal 2" thick lumber of the same width as framing members.

STUD FRAMING:

General: Provide stud framing of size and spacing indicated or, if not otherwise indicated, of the following sizes and spacings. Arrange studs so that wide face of stud is perpendicular to direction of wall or partition and narrow face is parallel. Provide single bottom plate and double top plates using 2" thick members with widths equaling that of studs; except single top plate may be used for non-load-bearing partitions. Nail or anchor

plates to supporting construction. Ensure that all studs are flush cut to ensure full contact bearing on all sills and to plate bearing surfaces.

Tolerances: Install all framed walls plumb and flush to receive finish surfaces included applied electrical items. All studs shall be installed true to a tolerance of 1/4" in either direction over full length. Level shall be a minimum of 1/4" in 10 feet any direction. General Contractor shall hand pick studs, and remove any stud not in compliance with the above requirement. Finishes which cannot be installed level, plumb, or flush due to tolerances in framing exceeding the above limits, shall be removed and replaced by the General Contractor at his expense. General Contractor shall inspect framing upon completion to ensure compliance with this requirement and modify framing as required.

For interior partitions and walls provide walls as per wall types shown on floor plan.

Construct corners and intersections with not less than 3 studs. Provide miscellaneous blocking and framing as shown and as required for support of facing materials, fixtures, specialty items and trim.

Provide continuous horizontal blocking row at mid-height of single-story partitions over 8' high and at ceiling line of all partitions, using 2" thick members of same width as wall or partitions.

Provide continuous horizontal flat 2 x 6 blocking at heights indicated for all walls to receive computer countertop installation.

Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Set headers on edge and support on jamb studs.

For non-bearing partitions, provide double-jamb studs and headers not less than 4" deep for openings 3' and less in width, and not less than 6" deep for wider openings.

END OF SECTION 06100

SECTION 06200 - FINISH CARPENTRY**PART 1 - GENERAL****RELATED DOCUMENTS:**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

DESCRIPTION OF WORK:

Definition: Finish carpentry includes carpentry work, which is exposed to view, is non-structural, and which is not specified as part of other sections.

Types of finish carpentry work in this section include:

Fiber cement lap siding, panels, single, trim, fascia, molding and accessories, James Hardie HZ10 Engineered for Climate Siding.

I

Interior running and standing trim.

Rough carpentry is specified in another Division-6 section.

Builder's Hardware and wood doors are specified in Division-8 sections.

Architectural woodwork is specified in another Division-6 section.

REFERENCES

ASTM D3359 - Standard Test Method for Measuring Adhesion by Tape Test, Tool and Tape.

ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C.

QUALITY ASSURANCE:

Installer Qualifications: Minimum of 2 years experience with installation of similar products.

Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.
- 4.

Factory-mark each piece of lumber and plywood with type, grade, mill and grading agency identification; except omit marking from surfaces to receive transparent finish, and submit mill certificate that material has been inspected and graded in accordance with requirements if it cannot be marked on a concealed surface.

SUBMITTALS:

Product Data: Submit manufacturer's specifications and installation instructions for each item of factory-fabricated siding and paneling, as per 01300.

Samples: Submit the following samples for each species and cut or pattern of finish carpentry.

Exterior standing and running trim 2'-0" long x full board or molding width, finished on one side and one edge.

Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

Interior standing and running trim 2'-0" long x full board or molding width, unfinished.

PRODUCT DELIVERY, STORAGE AND HANDLING:

Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

Do not deliver finish carpentry materials, until painting, wet work, grinding and similar operations, which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

Store products in manufacturers unopened packaging until ready for installation. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installation.

JOB CONDITIONS:

Conditioning: Installer shall advise Contractor of temperature and humidity requirements for finish carpentry installation areas. Do not install finish carpentry until required temperature and relative humidity have been stabilized and will be maintained in installation areas.

Maintain temperature and humidity in installation area as required to maintain moisture content of installed finish carpentry within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of woodwork shall determine optimum moisture content and required temperature and humidity conditions.

WARRANTY

Product Warranty: Limited, non-pro-rated product warranty.
HardieTrim HZ10 boards for 15 years.

Finish Warranty: Limited product warranty against manufacturing finish defects.
When used for its intended purpose properly installed and maintained according to Hardie's published installation instructions, James Hardie's ColorPlus finish with ColorPlus Technology, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip. Finish warranty includes the coverage for labor and material.

Workmanship Warranty: Application limited warranty for 2 years.

PART 2 - PRODUCTS

WOOD PRODUCT QUALITY STANDARDS:

Softwood Lumber Standards: Comply with PS 20 and with applicable grading rules of the respective grading and inspecting agency for the species and product indicated.

Plywood Standard: Comply with PS 1/ANSI A199.

Hardwood Lumber Standard: Comply with National Hardwood Lumber Association (NHLA) rules.

Glued-up Lumber Standard: Comply with PS 56.

Woodworking Standard: Where indicated for a specific product comply with specified provision of the following:

Architectural Woodwork Institute (AWI) "Quality Standards."

MATERIALS:

General:

Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and pattern as shown, unless otherwise indicated.

Moisture Content of Softwood Lumber: Provide kiln-dried (KD) lumber having moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.

Lumber for Transparent Finish (Stained or Clear): Use pieces made of solid lumber stock.

Lumber for Painted Finish: At Contractor's option, use pieces that are either glued-up lumber or made of solid lumber stock.

For exterior finish carpentry work use glued-up lumber complying with PS 56 for "wet use" and certified so by respective grading and inspecting agency for species and product indicated.

Exterior Finish Carpentry:

CEMENT SIDING

MANUFACTURERS

Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Email: [request info \(info@jameshardie.com\)](mailto:info@jameshardie.com); Web: www.jameshardiecommercial.com

Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01600.

CEMENT SIDING MATERIALS

HardiPanel HZ10 lap siding, requirement for Materials:

Fiber-cement Siding - complies with ASTM C 1186 Type A Grade II.

Fiber-cement Siding - complies with ASTM E 136 as a noncombustible material.

Fiber-cement Siding - complies with ASTM E 84 Flame Spread Index = 0, Smoke Developed Index = 5.
National Evaluation Report No. NER 405 (BOCA, ICBO, SBCCI, IBC, IRC).

- A. **Lap Siding:** HardiePlank HZ10 Lap siding with a sloped top, beveled drip edge and nailing line as manufactured by James Hardie Building Products, Inc.

Type: Select Cedarmill 8-1/4 inches (210 mm) with 7 inches (178 mm) exposure.

B. **Trim:**

1. HardieTrim HZ10 boards as manufactured by James Hardie Building Products, Inc.
2. HardieTrim HZ10 Fascia boards as manufactured by James Hardie Building Products.

FINISHES

Factory Primer: Provide factory applied universal primer.

Primer: Factory primed by James Hardie

Topcoat: Refer to Section 09900 and Exterior Finish Schedule.

PROTECTION: Factory applied finish protection such as plastic laminate that is removed once siding is installed

ACCESSORIES: Complete finishing system includes pre-packaged touch-up kit provided by fiber cement manufacturer. Provide quantities as recommended by manufacturer.

Furnish surfaced lumber for trim indicated to receive painted finish. Furnish saw-textured lumber for trim indicated to receive painted finish. **All siding, trim, & soffit materials shall be factory primed at all surfaces.**

Plywood for Painted Finish: Any softwood species, Exterior type, Medium Density Overlay (MDO/EXT-APA), of thickness indicated.

Plywood for Painted Finish: Any softwood species, Exterior type, Medium Density Overlay (MDO/EXT-APA), of thickness indicated.

Interior Finish Carpentry:

Standing and Running Trim for Transparent Finish: Plain Sliced Red Oak manufactured to sizes and patterns (profile) shown from selected First Grade lumber (NHLA); complying with following grade requirements of referenced woodworking standard, for quality of materials and manufacture:

Grade: FAS 1 & 2

Standing and Running Trim for Painted Finish: Birch material manufactured to sizes and patterns (profile) shown from selected First Grade lumber (NHLA); complying with following grade requirements of referenced woodworking standard, for quality of materials and manufacture:

Grade: Custom. (AWI)

Miscellaneous Materials:

Fasteners and Anchorage's: Provide nails, screws and other anchoring devices of the type, size, material and finish required for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications. Where finish carpentry is exposed on exterior or in areas of high relative humidity, provide fasteners and anchorages with a hot-dipped zinc coating (ASTM A 153).

PART 3 – EXECUTION

PREPARATION:

Condition wood materials to average prevailing humidity conditions in installation areas prior to installing. **Backprime lumber** for painted finish exposed on the exterior or, where indicated, to moisture and high relative humidities on the interior. Comply with requirements of section on painting within Division 9 for primers and their application.

Pre-installation Meeting: Meet at project site prior to delivery of finish carpentry materials and review coordination and environmental controls required for proper installation and ambient conditioning in areas to receive work. Include in meeting the Contractor, Architect and other Owner Representatives (if any), Installers of finish carpentry, wet work including plastering, other finishes, painting, mechanical work and electrical work, and firms and persons responsible for continued operation (whether temporary or permanent) of HVAC system as required to maintain temperature and humidity conditions. Proceed with finish carpentry on interior only when everyone concerned agrees that required ambient conditions can be properly maintained.

INSTALLATION:

Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes or patterns.

Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level countertops; and with 1/16" maximum offset in flush adjoining 1/8" maximum offsets in revealed adjoining surfaces.

Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.

Standing and Running Trim:

Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, to produce tight fitting joints with full surface contact throughout length of joint. Use scarf joints for end-to-end joints.

Make exterior joints water-resistant by careful fitting.

Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where pre-finished matching fasteners heads are required, use fine finishing nail for exposed nailings, countersunk and filled flush with finished surface, and matching final finish where transparent is indicated.

ADJUSTMENT, CLEANING, FINISHING AND PROTECTION:

Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

Clean finish carpentry work on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

Refer to Division 9 sections for final finishing of installed finish carpentry work.

Protection: Installer of finish carpentry work shall advise Contractor of final protection and maintained conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION 06200

SECTION 07200 - INSULATIONS**PART 1 - GENERAL****RELATED DOCUMENTS:**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

DESCRIPTION OF WORK:

Extent of insulation work is shown on drawings and indicated by provisions of this section.

Applications of insulation specified in this section include the following:

Blanket-type building insulation.

Loose granular insulation for cavity walls and masonry cells is specified in Division-4 section "Unit Masonry".

QUALITY ASSURANCE:

Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by r-values they represent the rate of heat flow through a homogenous material exactly 1" thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

Surface Burning Characteristics: ASTM E 84.

Fire Resistance Ratings: ASTM E 136

Combustion Characteristics: ASTM E 136.

SUBMITTALS:

Product Data: Submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.

Certified Tests Reports: With product data, submit copies of certified test reports showing compliance with specified performance values, including r-values (aged values for plastic insulation), densities, compression strengths, fire performance characteristics, perm ratings, water absorption ratings and similar properties.

DELIVERY, STORAGE, AND HANDLING:

General Protection: Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS:

Manufacturer: Subject to compliance with requirements, provide products of one of the following:

Manufacturers of Glass Fiber Insulation:

CertainTeed Corp.
Manville Corp.
Owens-Corning Fiberglas Corp.

INSULATING MATERIALS

General: Provide insulating materials which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics.

Prefomed Units: Sizes to fit applications indicated, selected from manufacturer's standard thickness, widths and lengths.

Unfaced Mineral Fiber Blanket/Batt Insulation: Thermal insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing); and as follows:

Mineral Fiber Type: Fibers manufactured from glass.

Combustion Characteristics: Passes ASTM E 136 test.

Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50, respectively.

Faced Mineral Fiber Blanket/Batt Insulation: Thermal insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type III, Class A (blankets with reflective vapor-retarder membrane facing with flame spread of 25 or less); foil-scrim-kraft vapor-retarder membrane on one face, respectively; and as follows:

Mineral Fiber Type: Fibers manufactured from glass.

Combustion Characteristics: Unfaced blanket/batt passes ASTM E 136 test.

Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50, respectively.

INSULATION SCHEDULE: Contractor shall insulate any exterior or interior wall which has been opened up by construction operations or all new construction. Insulate areas opened as instructed by architect.

Framed Exterior Walls: R-19 thermal insulation, at new shear walls and clerestory infills, and stuff into voids where no insulation is visible and required by current code when such cavities become accessible during construction and demolition.

AUXILIARY INSULATING MATERIALS:

Polyethylene Vapor Retarder: 6-mil polyethylene film, with laboratory-tested vapor transmission rating of 0.2 perms, natural color; to be applied on inside face of exterior cmu.

Metal Foil/Paper Vapor Retarder: 0.3-mil reflective aluminum foil laminated with scrim reinforcing to plastic-coated Kraft paper; laboratory-tested vapor transmission rating of 0.03 perms.

Mechanical Anchors: Type and size indicated or, if not indicated, as recommended by insulation manufacturer for type of application and condition of substrate.

Adhesive for Bonding Insulation: Type recommended by insulation manufacturer, and complying with requirements for fire performance characteristics.

PART 3 - EXECUTION

INSPECTION AND PREPARATION:

Require Installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain Installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

Clean substrates of substances harmful to insulation's or vapor retarders, including removal of projections which might puncture vapor retarders.

INSTALLATION, GENERAL:

Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.

Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

Apply a single layer of insulation of required thickness, unless otherwise noted on wall schedule on plans, shown or required to make up total thickness.

INSTALLATION OF GENERAL BUILDING INSULATION:

Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

Protect insulation on vertical surfaces (from damage during backfilling) by application of protection board. Set in adhesive in accordance with recommendations of manufacturer of insulation.

Protect top surface of horizontal insulation (from damage during concrete work) by application of protection board.

Seal joints between closed-cell (non-breathing) insulation units by applying 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 mastic or sealant.

Set vapor retarder faced units with vapor retarder to warm side of construction, except as otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.

Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure air-tight installation.

Set reflective foil-faced units accurately with air space in front of foil as shown. Provide not less than 0.75" air space where possible.

Place loose glass fiber insulation into spaces and onto surfaces as shown, either by pouring or by machine-blowing. Level horizontal applications to uniform thickness as indicated, lightly settled to uniform density, but not excessively compacted.

Stuff loose glass fiber insulation into miscellaneous voids and cavity spaces where accessible. Compact to approximately 40% of normal maximum volume (to a density of approximately 2.5 lbs. per cu. ft.)

INSTALLATION OF VAPOR RETARDERS:

General: Extend vaporretarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those which have been stuffed with loosefibertype insulation.

Seal vertical joints in vapor retarders over framing by lapping not less than 2 wall studs. Fasten vapor retarders to framing at top, end and bottom edges, at perimeter of wall openings and at lap joints; space fasteners 16" o.c.

Seal joints caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with cloth or aluminized tape of type recommended by vapor retarder manufacturer to create an air-tight seal between penetrating objects and vapor retarder.

Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with tape or another layer of vapor retarder.

PROTECTION:

General: Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by nondelayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION 07200

SECTION 72500 - WEATHER BARRIERS

PART 1 - GENERAL

RELATED DOCUMENTS.

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

Rough Carpentry is specified in Division 6.

Finish Carpentry is specified in Division 6.

Flashings are specified in Division 7.

Joints & Sealants are specified in Division 7.

Painting is specified in Division 9.

SUMMARY

Section Includes.

- Building paper
- Moisture Air Barrier Sheet
- Flexible flashing.

SYSTEM DESCRIPTION

The airtight components and secondary moisture protection of the building enclosure and the joints, junctures and transitions between materials, products, and assemblies forming the air-tightness and moisture barrier of the building enclosure are called "the air/moisture barrier system". Services include coordination between the trades, the proper scheduling and sequencing of the work, preconstruction meetings, inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by the Architect.

Air Barrier Penetrations: All penetrations of the air/moisture barrier and paths of air infiltration / exfiltration through the air/moisture barrier system shall be made air-tight.

Moisture Barrier Penetrations: All penetrations of the air/moisture barrier and paths of water migration through the air/moisture barrier system shall be made water shedding.

SUBMITTALS

Product Data: For each type of product.

For building wrap, include data on air and water-vapor permeance based on testing according to referenced standards including preparation instructions and recommendations, storage and handling requirements and recommendations, and installation methods.

INFORMATIONAL SUBMITTALS

Evaluation Reports: For water-resistive barrier and flexible flashing from ICC-ES.

REFERENCES

The American Association of Textile Chemists and Colorists (AATCC) 127 - Water Resistance: Hydrostatic Pressure Test.
American Society for Testing and Materials (ASTM) E-96 - Standard Test Methods for Water Vapor Transmission of Materials.
American Society for Testing and Materials (ASTM) D1117 - Standard Guide for Evaluating Nonwoven Fabrics.
American Society for Testing and Materials (ASTM) D3330 - Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape1.
American Society for Testing and Materials (ASTM) D3759 - Standard Test Method for Tensile Strength and Elongation of Pressure-Sensitive Tapes.
PSTC-1 - Peel Adhesion of Single Coated Pressure-Sensitive Tapes at 180 Degree Angle.
TAPPI T-460 - Porosity - Gurley.

QUALITY ASSURANCE

Installer Qualifications: Minimum of 2 years experience with installation of similar products.

Mock-Up: Provide a mock-up for evaluation of surface preparation and sealing techniques and application workmanship.

Finish areas designated by Architect.
Do not proceed with remaining work until workmanship is approved by Architect.
Repair mock-up area as required to produce acceptable work.

DELIVERY, STORAGE, AND HANDLING

Store products in manufacturer's unopened packaging until ready for installation.

Do not store in direct sunlight. Weather barrier shall be stored in a covered area. Do not expose to building site chemicals.

Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

PROJECT CONDITIONS

Anticipate environmental conditions and schedule installation when conditions are within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

WARRANTY

Product Warranty: Limited product warranty against manufacturing defects.
HardieWrap Weather Barrier and related products for 10 years.

PART 2 - PRODUCTS

WEATHER BARRIER @ PRE-FORMED METAL SIDING PANELS:

Building Paper : ASTM D 226, Type 1 (No. 30 asphalt-saturated organic felt), unperforated.

WEATHER BARRIER @ CEMENT SIDING & TRIM:

MANUFACTURERS

Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Email: [request info \(info@jameshardie.com\)](mailto:info@jameshardie.com); Web: www.jameshardiecommercial.com

Substitutions: Not permitted.

Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01600 prior to bid but must be pre-approved by siding mfr.

WEATHER BARRIER SYSTEM @ CEMENT SIDING AND TRIM LOCATIONS

Moisture Air Barrier Sheet:

Product: HardieWrap Weather Barrier as manufactured by James Hardie Building Systems.

Composition: Non-woven, non-perforated polyolefin.

Film: MicroTech Coating with micropores to balance water holdout and breathability.

Thickness: 11 mil (0.28 mm).

UV Stability: Up to 180 days.

Water Holdout (AATCC127): 128 inches (3250 mm).

Breathability/Water Vapor Permeance (ASTM E-96A): 15 perms.

Air Resistance (TAPPI T-460): >1800 sec/100 cc.

Tear Strength (ASTM D1117): 15 to 18 lb (6.8 to 8.2 kg).

Basis Weight: 19.4 lbs/1000 sf (9.5 kgs/100 sm).

Sizes: 3 feet by 195 feet (914 mm by 59.4 m), 9 feet by 100 feet (2743 mm by 30.5 m), 9 feet by 150 feet (2743 mm by 45.7 m), 10 feet by 100 feet (3048 mm by 30.5 m), 10 feet by 150 feet (3048 mm by 45.7 m).

Self-adhering Flashing: Designed for peel and stick application.

Flexible Flashing:

Product: HardieWrap Flex Flashing as manufactured by James Hardie Building Systems.

Composition: Butyl rubber adhesive; creped cross-laminated polyolefin backing; polyethylene film release.

Total Thickness: 60 mil (1.5 mm).

Tensile Strength (ASTM D3759): 18 lb/inch (3.2kg/cm).

UV Stability: Up to 180 days.

Water Vapor Transfer Rate (ASTM E96-94): <.2g/100 square inches/24hrs.

Application Temperature: 30 degree F to 180 degree F (-1 degree C to 82 degree

C).

Operating Temperature: -30 degree F to 200 degree F (-34 degree C to 93 degree C).

Packaging: Each roll is packed in a convenient dispenser box

Roll Weight: 6 inches (152 mm) = 22.2 lb (10kg)/roll, 9 inches (229 mm) = 33.3 lb (15 kg)/roll.

Provide Width for Application Required: 6 inches by 75 feet (152 mm by 23.9 m) (2x4 construction), 9 inches by 75 feet (229 mm by 23.9) (2x6 construction).

At Aluminum Storefront Windows: *Flexible flashing shall be provided by Aluminum Storefront Subcontractor as specified in Section 08410.*

Seam Tape:

Product: HardieWrap Seam Tape as manufactured by James Hardie Building Systems.

Composition: Polypropylene film coated with acrylic adhesive Total Thickness: 3.0 mil (.08 mm).

Adhesion Peel to HardieWrap (PSTC-1): 22 oz/inch (25 N/100 mm).

Tensile Strength (ASTM D3759): 32 lb/in (.58 kg/mm).

Elongation: 136 percent.

UV Stability: Up to 90 days.

Application Temperature: 30 degree F to 180 degree F (-1 degree C to 82 degree C).

Operating Temperature: -30 degree F to 200 degree F (-34 degree C to 93 degree C).

Packaging: Individually shrink-wrapped.

Roll Weight: 1 lb(0.5 kg)/roll.

Roll Size: 1-7/8 inches (43 mm) by 165 feet (50 m).

MISCELLANEOUS MATERIALS

Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film, to produce an overall thickness of not less than 0.040 inch (1.0 mm).

Products: Subject to compliance with requirements, **provide the following:** Product recommended by manufacturer of flexible flashing for substrate.

Primer for Flexible Flashing: Product recommended by manufacturer of flexible flashing for substrate.

PART 3 - EXECUTION

EXAMINATION

Do not begin installation until substrates have been properly prepared.

If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

PREPARATION

Clean surfaces thoroughly prior to installation.

Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

Weather barrier shall be installed before window and door installation. Do not install on saturated sheathing. Weather barrier can become slippery and should not be used in any application where it may be walked on.

Weather barrier shall be installed on vertical wall applications only.

Manufacturer warrants weather barrier sheet only when covered within 180 days of its installation.

WATER-RESISTIVE BARRIER INSTALLATION**Moisture Air Barrier Sheet @ Cement Siding and Trim:**

Weather barrier shall be installed before window and door installation. Do not install on saturated sheathing. Weather barrier can become slippery and should not be used in any application where it may be walked on.

Begin by affixing weather barrier extending at least 6 inches (152 mm) around a building corner. Unroll horizontally (with print side facing out) around the building covering rough window and door openings.

Fasten to studs or nailable sheathing material with galvanized construction grade staples a maximum of 18 inches (457 mm) in the vertical and horizontal direction.

Attach weather barrier so that it is taut and flat. The vertical overlap shall have a minimum of 6 inches (152 mm) and the vertical seam shall be taped.

Assure that the bottom edge of the weather barrier extends over the sill plate and foundation interface by at least 1 inch (25 mm).

Overlap upper layers of weather barrier (in shingle lap fashion) by a minimum of 6 inches below the horizontal edge, and tape the horizontal seam line.

At roof to wall intersection (or wall to deck), affix wrap to the wall such that it overlaps any step flashing already in place on the wall by at least 2 inches (51 mm).

Flexible Flashing:

Windows and Doors and Grills at all locations whether in walls with cement siding and trim or preformed metal siding: Weather barrier is not designed nor guaranteed as a flashing material to prevent moisture or air from intruding behind weather barrier. Verify that flashing has previously been installed around all windows and door openings. Install flexible flashing per manufacturer's instructions.

Use the inverted "Y" cut method at rough window and door openings. Do not place fasteners within 9 inches (229 mm) of the rough opening, door or window heads. This area shall not be fastened to allow for proper head flashing installation. At the top corners of the rough opening, cut the weather barrier at 45 degree to extend 9 inches (229 mm) past the joint.

Fold the top flap up and out of the way and fasten temporarily.

Fold the remaining three flaps in through the opening fastening them inside the opening with staples.

Rough Electrical and Plumbing Penetrations: Seal with a double layer of flashing. Install the top flashing piece over the bottom flashing piece overlapping flashing layers to cover flashing cut-out necessary for placement around penetration.

Repairs: For minor punctures or tears, less than 3 inches (76 mm), cover and completely seal with seam tape. For larger holes, greater than 3 inches (76 mm), use slit flashing technique.

Slit flashing requires making a horizontal slit above the damaged area and placing a cut piece of weather barrier into the slit, covering the damaged area. Tape the perimeter of the patched area.

PROTECTION

Protect installed products until completion of project.

Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 72500

SECTION 07311 - ASPHALT SHINGLES

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

DESCRIPTION OF WORK:

Extent of shingles is to include all roofs and roof jack type vents.

QUALITY ASSURANCE:

UL Listing: Provide labeled materials which have been tested and listed by UL for Class and Rating indicated for each shingle type required.

SUBMITTALS:

Product Data: Submit technical product data installation instructions, and recommendations from shingle manufacturer, including data that materials comply with requirements.

Samples: Submit full range of samples for color and texture selection. After selection, submit 2 full-size shingles for verification of each color/style/texture selected.

Maintenance Stock: 2 Squares each type/color/texture shingle used in the work.

DELIVERY, STORAGE AND HANDLING:

Deliver materials in manufacturer's unopened, labeled containers.

Store materials to avoid water damage, and store rolled goods on end. Comply with manufacturer's recommendations for job-site storage and protection.

JOB CONDITIONS:

Substrate: Proceed with shingle work only after substrate construction and penetrating work have been completed.

Weather Conditions: Proceed with shingle work only when weather conditions are in compliance with manufacturer's recommendations and when substrate is completely dry.

SPECIFIED PRODUCT WARRANTY:

Provide shingle manufacturer's warranty on installed work, agreeing to pay for repair or replacement of defective shingles as necessary to eliminate leaks. Period of warranty is 30 years from date of substantial completion for asphalt composition shingles.

PART 2 - PRODUCTS

ASPHALT SHINGLE MATERIALS:

30 Year Asphalt Laminated Shingles, UL Class "A", Mineral-surfaced, self-sealing, laminated multi-ply overlay construction fiberglass based strip shingle complying with ASTM D 3018, Type 1, and with ASTM D 3462, ASTM D228,. Provide shingles bearing UL Class "A" external fire exposure label and UL 790, Class A, ASTM D 3161 Class F wind, ASTM D 7158 Class H Wind,. Color as selected by Architect. Provide Lifetime Warranty, Wind Resistance Warrantee up to 130 MPH, Algae Resistance Warranty 10 years, and True Protection Non-Prorated Warranty for 10 years.

Products: Subject to compliance with requirements, provide one of the following:

Duration Shingles, manufactured by Owens Corning
Or equal approved by architect as per 01631.

Building Paper: ASTM D 226, Type I; asphalt saturated felt, non-perforated, 30-lb. type.

Asphalt Plastic Cement: Fibrated asphalt cement complying with ASTM D 2822, designed for trowel application.

Hip and Ridge Shingles: Manufacturer's standard hip and ridge with Sealant factory pre-cut units to match shingles.

Nails: Aluminum or hot-dip galvanized 11 or 12-gage sharp pointed conventional roofing nails with barbed shanks, minimum 3/8" diameter head, and of sufficient length to penetrate 3/4" into solid decking or to penetrate through plywood sheathing.

Roof Jack Vents: Owens Corning Roof Vents, VTSG-144 Color as selected with 144" free ventilation area. Other manufacturers of equal area and finish are acceptable.

PART 3 - EXECUTION:

INSPECTION:

Examine substrate and conditions under which shingling work is to be performed and must notify Owner in writing of unsatisfactory conditions. Do not proceed with shingling work until unsatisfactory conditions have been corrected.

PREPARATION OF SUBSTRATE:

Clean substrate of any projections and substances detrimental to shingling work. Cover knotholes or other minor voids in substrate with sheet metal flashing secured with roofing nails.

Coordinate installation of shingles with flashing and other adjoining work to ensure proper sequencing. Do not install shingle roofing until all vent stacks and other penetrations through roofing have been installed and are securely fastened against movement.

INSTALLATION:

General: Comply with instructions and recommendations of shingle manufacturer, except to extent more stringent requirements are indicated.

Underlayment: Apply one layer felt horizontally over entire surface, lapping succeeding courses 2" minimum and fastening with sufficient nails to hold in place until shingle application.

Shingles: Install starter strip of OC Starter Strip Plus Shingle; nail shingles in manufacturer's recommended pattern, weather exposure and number of fasteners per shingle as recommended by manufacturer. Use horizontal and vertical chalk lines to ensure straight coursing.

Comply with installation details and recommendations of shingle manufacturer and NRCA Steep Roofing Manual.

Flashing and Edge Protection: Install metal flashing, vent flashing and edge protection as indicated and in compliance with details and recommendations of the NRCA Steep Roofing Manual. **Install Ice and Water Shield (by Owens Corning) in all valleys and all eaves typical.**

EXTRA STOCK:

Provide minimum of 2% of installed quantity of each type/color/ texture shingle used in the work. Provide in unopened clearly labeled bundles or containers.

END OF SECTION 07311

SECTION 07600 - FLASHING AND SHEET METAL**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

Preformed Metal Siding is specified in 07410.

SUMMARY

This Section includes the following:

Metal counter flashing and base flashing (if any).

Gutters, downspouts, (rain drainage).

Exposed metal trim/fascia units.

Miscellaneous sheet metal accessories.

Integral masonry flashings are shown on masonry details and should be included herewith.

SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Product data, Flashing, Sheet Metal, and Accessories: Manufacturer's technical product data, installation instructions and general recommendations for each specified sheet material and fabricated product.

Samples of the following flashing, sheet metal, and accessory items:

12-inch-long samples of factory-fabricated products exposed as finished work. Provide complete with specified factory finish.

Shop drawings showing layout, profiles, methods of joining, and anchorages details, including major counterflashings, trim/fascia units, gutters, downspouts. Provide layouts at 1/4-inch scale and details at 3-inch scale.

Provide plans & details of all roofs. Submit within 2 weeks of contract award, for approval by owner & architect. Submit 6 copies. Plans shall not be Xerox copies of blueprints but shall be generated by Contractor.

PROJECT CONDITIONS

Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

PART 2 - PRODUCTS**SHEET METAL FLASHING AND TRIM MATERIALS**

Zinc-Coated Steel: Commercial quality with 0.20 percent copper, ASTM A 526 except ASTM A 527 for lock-forming, G90 hot-dip galvanized. Gauge as detailed. For use at locations not visible, where compatible with surrounding material, and only as approved by architect.

Lead: ASTM B 749, Type L51121, copper-bearing sheet lead, minimum 4 lb/sq. ft. (0.0625 inch) except not less than 6 lb/sq. ft. (0.0937 inch thick) for burning (welding) unless otherwise indicated. Use only at plumbing vents or other roof penetrations as detailed.

Miscellaneous Materials and Accessories:

Solder: For use with steel or copper, provide 50 - 50 tin/lead solder (ASTM B 32), with rosin flux.

Solder: For use with stainless steel, provide 60 - 40 tin/lead solder (ASTM B 32), with acid-chloride type flux, except use rosin flux over tinned surfaces.

Fasteners: Same metal as flashing/sheet metal or other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

Bituminous Coating: SSPC - Paint 12, solvent-type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, non-drying, nonmigrating sealant.

Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealers."

Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior nonmoving joints including riveted joints.

Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of flashing sheet.

Paper Slip Sheet: 5-lb. rosin-sized building paper.

Polyethylene Underlayment: Minimum 6-mil carbonated polyethylene film resistant to decay when tested in accordance with ASTM E 154

Reglets: Metal units of type and profile indicated, compatible with flashing indicated, noncorrosive.

Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.

Elastic Flashing Filler: Closed-cell polyethylene or other soft closed-cell material recommended by elastic flashing manufacturer as filler under flashing loops to ensure movement with minimum stress on flashing sheet.

Roofing Cement: ASTM D 2822, asphaltic.

FABRICATED UNITS

General Metal Fabrication: Shop-fabricate work to greatest extent possible. Field measure site conditions prior to fabricating work. Comply with details shown and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems. **All flashing & sheet metal shall have a Kynar 500 finish with a 30 year warranty and shall be 24 ga.**

Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required

Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

Sealant Joints: Where movable, nonexpansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

Shop Finish, Rain Drainage: Provide manufacturer's Kynar 500 shop finish (30 year warranty) on sheet metal rain drainage units (gutters, downspouts, and similar exposed units) ; 1.0-mil dry film thickness. Color as selected by architect. **Gutters shall be 5" ogee style gutters as detailed, with concealed fasteners in lieu of spike and ferules, and must include leaf guards equal to the EZ Lock regular hole, steel powder coated screen. Downspouts shall be standard sheet metal downspouts. All colors shall be selected by architect or as noted on drawings. DS shall match wall color behind it.**

PART 3 EXECUTION

INSTALLATION REQUIREMENTS

General: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations and with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof. Verify shapes and dimensions of surface to be covered. Beginning of installation constitutes acceptance of existing conditions. Prime all sheet flanges that are to be mopped into the roofing with asphalt primer. Secure flashings in place with concealed fasteners. Use exposed fasteners only in locations approved by owner.

Underlayment: Where stainless steel or aluminum is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.

Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance

Install reglets to receive counterflashing in manner and by methods indicated. Where shown in concrete, furnish reglets to trades of concrete work for installation as work of Division 3 sections. Where shown in masonry, furnish reglets to trades of masonry work, for installation as work of Division 4 sections.

Install counterflashing in reglets, either by snap-in seal arrangement or by welding in place for anchorage and filling reglet with mastic or elastomeric sealant, as indicated and depending on degree of sealant exposure.

Install elastic flashing in accordance with manufacturer's recommendations. Where required, provide for movement at joints by forming loops or bellows in width of flashing. Locate cover or filler strips at joints to facilitate complete drainage of water from flashing. Seam adjacent flashing sheets with adhesive, seal and anchor edges in accordance with manufacturer's recommendations.

Nail flanges of expansion joint units to curb nailers, at maximum spacing of 6 inches o.c. Fabricate seams at joints between units with minimum 3-inch overlap, to form a continuous, waterproof system.

CLEANING AND PROTECTION

Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

Protection: Advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration other than natural weathering at time of Substantial Completion. Touch up minor chipping of prepainted items with approved touch up paint. Excessive damage to finish shall result in rejection of the material.

END OF SECTION 07600

SECTION 07900A - JOINT SEALANTS**PART 1 - GENERAL****RELATED DOCUMENTS:**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section. It shall be the General Contractors responsibility to ensure all areas requiring sealant are included in the bid. Any fire rated penetrations shall be fully sealed as required by code and local fire marshal. This shall include all edges and perimeters.

SUMMARY:

Extent of each form and type of joint sealer is indicated on drawings and schedules. It is the General Contractor's responsibility to ensure all sealants are installed by professional qualified installers using approved and suitable materials in a professional and warrantyable manner commensurate with industry standards for exterior building envelope.

This Section includes:

Preparing sealant substrate surfaces.
Sealant and backing.

RELATED SECTIONS

Sealing joints related to flashing and sheet metal for roofing is specified in Division 07600 Section: "Flashing and Sheet Metal."

Sealants for Aluminum Entrance & Storefront are specified in Division-8 Section 08410; Aluminum Entrance & Storefront.

Sealants for glazing purposes are specified in Division-8 Section "Glass and Glazing."

Sealing concealed perimeter joints of gypsum drywall partitions to reduce sound transmission characteristics is specified in Division-9 Section A & B "Gypsum Drywall."

Sealing tile joints is specified in Division-9 Section "Tile."

SYSTEM PERFORMANCES:

Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

SUBMITTALS:

Product Data from manufacturers for each joint sealer product required, including instructions for joint preparation and joint sealer application.

Shop Drawings or catalog illustrations in sufficient detail to show installation and interface of the work of this Section with the work of adjacent trades.

Samples for Initial Selection Purposes: Manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.

Samples for verification purposes of each type and color of joint sealer required. Install joint sealer samples in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealers.

Certificates from manufacturers of joint sealers attesting that their products comply with specification requirements and are suitable for the use indicated.

Qualification data complying with requirements specified in "Quality Assurance" article. Include list of completed projects with project name, addresses, names of Architects and Owners, plus other information specified.

Compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.

Product test reports for each type of joint sealers indicated, evidencing compliance with requirements specified.

Preconstruction field test reports indicating which products and joint preparation methods demonstrated acceptable adhesion to joint substrates.

QUALITY ASSURANCE:

Perform work in accordance with the following:

Building Joints: ASTM C 1193.

Laboratory Pre-Construction Testing:

Test sealants, joint accessories, and joint substrates in accordance with the following, before starting work of this section:

Obtain samples of joint substrate products specified in other sections.

Adhesion: ASTM C 794 and ASTM C 719; determine surface preparation and required primer.

Compatibility: ASTM C 1087; determine materials forming joints and adjacent materials do not adversely affect sealant materials and do not affect sealant color.

Staining: ASTM D 2203, ASTM C 510, or ASTM C 1248; determine sealants will not stain joint substrates.

Pre-construction testing is not be required when sealant manufacturer can furnish data acceptable to Architect based on previous testing for materials matching those of the Work.

Field Pre-Construction Testing:

Test each elastomeric sealant and joint substrate in accordance with the following, before beginning work of this section:

Install sealants in mockups using joint preparation methods determined by laboratory pre-construction testing.

Remove existing sealant, clean joint, and install new sealant using manufacturer's recommended joint preparation methods.

Install field-test joints in inconspicuous location as approved by Architect.

Test Method: Manufacturer's standard field adhesion test to verify joint preparation and primer required to obtain optimum adhesion of sealants to joint substrate. When test indicates sealant adhesion failure, modify joint preparation, primer, or both and retest until joint passes sealant adhesion test.

QUALIFICATIONS

Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.

Applicator Qualifications:

Company specializing in performing work of this section with minimum three years documented experience, minimum three successfully completed projects of similar scope and complexity, and approved by manufacturer.

Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this section.

Designate one individual as project foreman who shall be on site at all times during installation.

MOCKUP

Install sealants in mockups specified in other sections including sealant and joint accessories to illustrate installation quality and color.

Incorporate accepted mockup as part of Work.
Repair seal joint mockups used for field adhesion testing.

PRE-INSTALLATION MEETINGS

Convene meeting minimum one week prior to commencing work of this section.

Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.

Investigate materials failing compatibility or adhesion tests and obtain joint sealer manufacturer's written recommendations for corrective measures, including use of specially formulated primers.

Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.

Evaluation of Field 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, which fail to adhere to joint substrates during testing.

Perform work in accord with ASTM C-1193 guidelines except where more stringent requirements are indicated or specified.

DELIVERY, STORAGE, AND HANDLING:

Deliver materials to Project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.

Store and handle materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

PROJECT CONDITIONS:

Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:

When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturers.

When joint substrates are wet due to rain, frost, condensation, or other causes.

Joint Width Conditions: Do not proceed with installation of joint sealers where joint widths are less than allowed by joint sealer manufacturer for application indicated.

Joint Substrate Conditions: Do not proceed with installation of joint sealers until contaminants capable of interfering with their adhesion are removed from joint substrates.

SEQUENCING AND SCHEDULING:

Sequence installation of joint sealers to occur not less than 21 nor more than 30 days after completion of waterproofing, water repellents, unless otherwise indicated.

WARRANTY

Deliver to Architect signed copies of the following written warranties against adhesive and cohesive failure of the sealant and against filtration of water and air through the sealed joint for a period of 3 years from date of substantial completion.

Manufacturer's standard warranty covering sealant materials;
Applicators standard warranty covering workmanship

PART 2 - PRODUCTS**MATERIALS, GENERAL:****Acceptable Manufacturer's:**

Tremco/Vulkem by Mameco International Inc. Cleveland OH 1-800-321-6412.

Sika Precora

Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience. Provide all sealants from one manufacturer to insure compatibility.

Colors: Provide color of exposed joint sealers indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

Sealant Type 1:

Exterior joints in vertical surfaces and nontraffic horizontal surfaces as, but not limited to:

- Control and expansion joints in cast-in-place concrete.
- Joints between architectural precast concrete units.
- Control and expansion joints in unit masonry.
- Joints in Exterior Insulation and Finish System.
- Joints between different materials listed above.
- Perimeter joints between materials listed above and frames of doors and windows, storefronts, louvers and similar openings.
- Control and expansion joints in ceiling and overhead surfaces.
- Under metal thresholds and saddles.
- Bedding bead for sheet metal flashings and frames of metal or wood.
- Between laps in fabrication of sheet metal.
- Other joints as indicated.

Provide single-component or multi-component, low-modulus, non-sag silicone sealant that is suitable for continuous immersion in water; comply with ASTM C920, Type S or M, Grade NS, Class 2.

Tremco Spectrem 2 around glazing window system.

Tremco Spectrem 1 around porous surfaces
Or approved equal from other manufacturers.

Sealant Type 2:

Interior joints in vertical surfaces and horizontal nontraffic surfaces such as but not limited to:

- Control and expansion joints on exposed interior surfaces of exterior walls.
- Perimeter joints of exterior openings where indicated.
- Joints between tops of non-load-bearing unit masonry walls and underside of cast-in-place concrete slabs and beams.
- Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
- Joints on underside of precast beams and planks.
- Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances, and similar openings.
- Trim and finish joints subject to movement.
- Between laps in fabrications of sheet metal.
- Perimeter joints of toilet fixtures.
- Other joints as indicated.

Provide single-component or multi-component, low-modulus, non-sag polyurethane sealant having plus or minus 25 percent joint movement capability that is suitable for continuous immersion in water; comply with ASTM C920, Type S or M, Grade NS, Class 25.

Tremco; Dymeric FC, Dymeric 240FC, or approved equal.

Sealant Type 3:

Exterior and interior joints in horizontal and sloped traffic surfaces such as, but not limited to:

- Control, expansion and isolation joints in cast-in-place concrete.
- Joints between architectural precast concrete paving units.
- Tile control and expansion joints.
- Joints between different materials listed above.
- Other joints as indicated.

Provide single-component or multi-component, polyurethane sealant having a Shore A hardness of not less than 25 or more than 50 and plus or minus 25 percent joint movement capability that is suitable for continuous immersion in water; comply with ASTM C920, Type S or M, Grade P or NS, Class 25.

Tremco Vulkem 45SSL or THC-900/901, or approved equal.

Sealant Type 4:

Exterior joints in vertical surfaces and nontraffic horizontal surfaces requiring a virtually odor free sealant.

- Provide single-component, no vapor, low-modulus, 100 percent solids polyurethane sealant that is suitable for continuous immersion in water; comply with ASTM C920, Type S, Grade NS, Class 25.

Tremco, Dymeric FC or Vulkem 921
Or approved equal

Sealant Type 5:

Exterior joints and interior joints in horizontal and sloped surfaces up to 6 percent requiring a virtually odor free sealant.

- Provide single-component, no vapor, low-modulus, 100 percent solids polyurethane sealant that is suitable for continuous immersion in water; comply with ASTM C920, Type S, Grade P, Class 25.

Tremco Vulkem 45SSL, or approved equal. .

Sealant Type 6:

Interior joints in vertical surfaces and horizontal nontraffic surfaces requiring pick-resistant security sealant such as but not limited to:

- Control and expansion joints on exposed interior surfaces of exterior walls.
- Perimeter joints of exposed interior surfaces of exterior openings.
- Perimeter joints between concrete surfaces and frames of interior doors, windows and similar openings.
- Trim and finish joints subject to minimal movement.
- Other joints as indicated.

Provide single-component or multi-component, non-sag polyurethane sealant having a Shore A hardness of 55 minimum.

Sealant Type 7:

Exterior joints and interior joints in vertical and horizontal surfaces requiring USDA approved sealant.

Provide single-component, or multi-component polyurethane sealant approved by the USDA for incidental food contact with the cured sealant; comply with ASTM C920, Type S or M, Grade P or NS, Class 25, select color from listing of those approved.

Tremco Dymenic FC, Vulkem 45SSL, Vulkem 116, Dymenic 240FC, THC-900/901 For urethanes, or approved equal.

Sealant Type 8:

For applications at acoustical walls in exposed locations around doors, windows and concealed spaces at the intersection of a continuous metal track and concrete floor.

Provide acoustical Butyl Rubber Caulking, ASTM C919, Non-sag, one component.

Tremco, Tremflex 834 for exposed areas, or approved equal.

Sealant Type 9:

For applications in concealed spaces, such as under continuous metal track and concrete floor.

Provide acoustical tape sealant, medium density Polyvinyl chloride Foam Tape Sealants, SST 15, Tremco Acoustical Sealant in concealed areas. Or approved equal.

Sealant Type 10:

For applications around interior doors and windows, casework and backsplashes.

Provide water based acrylic latex sealant; ASTM C834. Single component, fast setting with minimal shrinkage.

Tremco, Tremflex 834, or approved equal.

Sealant Type 11:

For applications at exposed interior prefinished locations such as restrooms, mop sinks, and classroom sinks; provide fungus resistant properties.

Provide silicone sealant; ASTM C920, Grade NS, Type S, Class 25.

Sealant Type 12:

For applications in concealed spaces, such as under continuous metal track and concrete floor.

Provide acoustical tape sealant, medium density Polyvinyl chloride Foam Tape Sealants, 440 II Tape by Tremco.

Sealant Type 13:

For applications in fire rated walls, at penetrations such as pipes, ducts, conduit and other penetrations through one hour rate partitions.

Provide 3M Fire Barrier CPWB + Tremco Tremstop Acrylic

END OF SECTION 7900A

PART B - SECTION 07900**FIRE-RESISTANT JOINT SEALANTS:**

General: Provide manufacturer's standard fire-stopping sealant, with accessory materials, having fire-resistance ratings indicated as established by testing identical assemblies per ASTM E 814 by Underwriters Laboratory, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction.

Foamed-In-Place Fire-Stopping Sealant: Two-part, foamed-in-place, silicone sealant formulated for use in a through-penetration fire-stop system for filling openings around cables, conduit, pipes and similar penetrations through walls and floors.

One-Part Fire-Stopping Sealant: One part elastomeric sealant formulated for use in a through-penetration fire-stop system for sealing openings around cables, conduit, pipes and similar penetrations through walls and floors.

Products: Subject to compliance with requirements, provide one of the following:

Foamed-In-Place Fire-Stopping Sealant:

"Dow Corning Fire Stop Foam"; Dow Corning Corp.
"Pensil 851"; General Electric Co.

One-Part Fire-Stopping Sealant: <http://www.tremcosealants.com/commercial/firestop/default.asp>

"Dow Corning Fire Stop Sealant"; Dow Corning Corp.
"3M Fire Barrier Caulk CP-25"; Electrical Products Div./3M.
"RTV 7403"; General Electric Co.
"Fyre Putty"; Standard Oil Engineered Materials Co.

JOINT SEALANT BACKING:

General: Provide sealant backings of material and type which are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonwaxing, nonextruding strips of flexible, nongassing plastic foam of material indicated below; nonabsorbent to water and gas; and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

Either open-cell polyurethane foam or closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer, for cold-applied sealants only.

Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-15 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

MISCELLANEOUS MATERIALS:

Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealer-substrate tests and field tests.

Cleaners for Nonporous Surfaces: Provide nonstaining, chemical cleaners of type which are acceptable to manufacturers of sealants and sealant backing materials, which are not harmful to substrates and adjacent nonporous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in-service performance.

Masking Tape: Provide nonstaining, nonabsorbent type compatible with joint sealants and to surfaces adjacent to joints.

Accessory Materials for Fire-Stopping Sealants: Provide forming, joint fillers, packing and other accessory materials required for installation of fire-stopping sealants as applicable to installation conditions indicated.

PART 3 - EXECUTION

EXAMINATION:

Examine joints indicated to receive joint sealers, with Installer present, for compliance with requirements for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.

PREPARATION:

Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; old joint sealers; oil; grease; waterproofing; water repellants; water; surface dirt; and frost.

Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

Remove laitance and form release agents from concrete.

Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile; and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.

Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which 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.

INSTALLATION OF JOINT SEALERS:

General: Comply with joint sealer manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 962 for use of joint sealants as applicable to materials, applications and conditions indicated.

Solvent-Release-Curing Sealant Installation Standard: Comply with requirements of ASTM C 804 for use of solvent-release-curing sealants.

Latex Sealant Installation Standard: Comply with requirements of ASTM C 790 for use of latex sealants.

Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.

Do not leave gaps between ends of joint fillers.

Do not stretch, twist, puncture, or tear joint fillers.

Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.

Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.

Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.

Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

Provide concave joint configuration per Figure 6A in ASTM C 962, unless otherwise indicated.

Use masking tape to protect adjacent surfaces of recessed tooled joints.

Provide Recessed joint configuration per Figure 6C in ASTM C 962, of recess depth and at locations indicated.

Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's directions for installation methods, materials, and tools which produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformance with sealant manufacturer's recommendations.

Installation of Preformed Hollow Neoprene Gaskets: Install gaskets, with minimum number of end joints, in joint recesses with edges free of spalls and sides straight and parallel, both within tolerances specified by gasket manufacturer. Apply manufacturer's recommended adhesive to joint substrates immediately prior to installing gaskets. For straight sections provide gaskets in continuous lengths; where changes in direction occur, adhesively splice gasket together to provide watertight joint. Recess gasket below adjoining joint surfaces by 1/8 inch to 1/4 inch.

Installation of Fire-Stopping Sealant: Install sealant, including forming, packing, and other accessory materials to fill openings around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

CLEANING:

Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

PROTECTION:

Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION 07900

SECTION 08110 - HOLLOW METAL DOORS AND FRAMES**PART 1 - GENERAL****RELATED DOCUMENTS:**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

DESCRIPTION OF WORK:

Extent of standard steel doors and frames is indicated on drawings and as noted below.

Finish hardware is specified elsewhere in Division 8.

QUALITY ASSURANCE:

Provide doors and frames complying with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.

SUBMITTALS:

Product Data: Submit manufacturer's technical product data substantiating that products comply with requirements.

Shop Drawings: Submit for fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings. Submittals which use different numbers, are confusing, or unorganized, difficult to compare to the contract documents, will be returned without review, stamped "revise and resubmit." Contract shall coordinate and carefully select frame width based upon wall types shown on plans. Contractor is responsible to ensure proper frame widths for each wall type.

Indicate coordinate of glazing frames and stops with glass and glazing requirements.

DELIVERY, STORAGE AND HANDLING:

Deliver hollow metal work cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory-finished doors.

Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.

Store doors and frames at building site under cover. Place units on minimum 4" high wood blocking. Avoid use of non-vented plastic or canvas shelters, which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS:

Manufacturer: Subject to compliance with requirements, provide steel doors and frames by one of the following:

Hollow Metal Doors, (General):

Curries Mfg., Inc.
Ceco
Steelcraft

Thermal Rated Steel Door and Frame Assemblies:

Curries Mfg., Inc.
Ceco Products Corp.
Steelcraft

MATERIALS:

Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.

Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.

Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, with ASTM A 525, G60 zinc coating, mill phosphatized.

Supports and Anchors: Fabricate of not less than 18- gage galvanized sheet steel.

Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanized items to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.

Shop Applied Paint:

Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints.

FABRICATION, GENERAL:

Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, 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. Comply with SDI-100 requirements as follows:

Exterior Doors: SDI-100, Grade III, extra heavy-duty, Model 2, minimum 18-gage faces.

Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel.

Fabricate exterior doors, panels, and frames from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction with addition of minimum 14-gage inverted steel channels surround and for reinforcement at all Locks, Closers, and Exit Devices... All out swinging doors shall have flush top caps sealed with silicone.

Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.

Thermal-Rated (Insulating) Assemblies:

At exterior locations and elsewhere as shown or scheduled, provide doors which have been fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C 236.

Unless otherwise indicated, provide thermal-rated assemblies with U factor of 0.24 Btu/(hr. x ft.sq. x of).

Finish Hardware Preparation: Prepare doors and coordinate with alum storefront frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templated provided by hardware supplier. Comply with applicable requirements of ANSI A115 series specifications for door and frame preparation for hardware.

For concealed overhead door closers, provide space, cutouts, reinforcing and provisions for fastening in top rail of doors or head of frames, as applicable.

Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site.

Locate finish hardware as indicated on final shop drawings or, if not shown, in accordance with "Recommended Locations for Builder's Hardware," published by Door and Hardware Institute.

Insulated Panels: Provide GlazeGuard 1000 Opaque Glazing Panels at all locations shown on plans. Provide 1" thick panels with expanded polystyrene core with textured pre-finished aluminum skin, color as selected by architect.

Shop Painting:

Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.

Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.

Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

STANDARD STEEL DOORS:

Provide metal doors of types and styles indicated on drawings or schedules. Comply with the following minimum requirements:

1. 90 lb phenolic resin impregnated honeycomb core laminated to the inside face.
2. Steel hat channels at 6" centers welded to both faces. Internal voids filled with an inert material to sound deaden and insulate.
3. Polystyrene foam permanently and fully bonded to the entire surface of face skins.
4. Provide high frequency hinge reinforcement at top hinge.
5. Doors shall be beveled at both edges. Square edge doors with loose hinge fillers will not be allowed.

Door Silencers: Except on weather-stripped frames, drill stops to receive 3 silencers on strike jambs of single-swing frames and 2 silencers on heads of double-swing frames.

Plaster Guards: Provide 26-gage steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

PART 3 - EXECUTION

INSPECTION:

INSTALLATION:

General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

Placing Frames: Coordinate with Aluminum Storefront Installer and Mfr.

In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wire tie. In closed steel stud partitions, attach wall anchors to studs with tapping screws.

Door Installation:

Fit hollow metal doors accurately in frames, within clearances specified in SDI-100.

Place fire-rated doors with clearances as specified in NFPA Standard No. 80.

ADJUST AND CLEAN:

Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION 08110

SECTION 08520 - VINYL WINDOWS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

SUMMARY

This Section includes commercial-grade vinyl window units of the performance class indicated.

Window types required include:

Fixed Windows

Applications of vinyl windows on project include the following:

Individual units set in conventional wall construction.

SYSTEM PERFORMANCE REQUIREMENTS

General: Provide vinyl window units that comply with performance requirements specified, as demonstrated by testing manufacturer's corresponding stock systems according to test methods indicated.

Design Requirements: Comply with structural performance, air infiltration, and water penetration requirements indicated in AAMA/NWWDA 101/IS.2-97 for type, grade, and performance class of window units required.

Heights of window units above grade at the window centerline are indicated or can be determined from the drawings. Consult with the Architect for clarification needed to confirm required loading and test pressures.

Design wind velocity at the project site is 80 mph.

Thermal Transmittance: Provide window units that have a U-value maximum of 0.50 BTU/hour/sq. ft./deg F at 15-mph exterior wind velocity, when tested in accordance with AAMA 1503.1.

Windows to meet performance standards for:

1. ASTM E 283-91 Test method for infiltration rate of air leakage through exterior windows, curtain walls, and doors under specified pressure differences across the specimen.
2. ASTM E 330-90 Test method for structural performance of exterior windows, and doors by uniform static air pressure difference.
3. ASTM E-547-93 Test method for water penetration of exterior windows, curtain walls, and doors by static air pressure differential.

SUBMITTALS

General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

Product data for each type of window required, including:

Construction details and fabrication methods.

Profiles and dimensions of individual components.

Data on hardware, accessories, and finishes.

Recommendations for maintenance and cleaning of exterior surfaces.

Specifications, technical support data, installation recommendations, standard details for each type of unit required, including finishing methods, hardware, and accessories.

Product Drawings for each type of window specified, submit standard assembly and details for specific application on this project.

Color Samples: Submit samples of each required exterior finish on PVC sample.

Certification: Provide certification by a recognized independent testing laboratory or agency showing that each type, grade, and size of window unit complies with performance requirements indicated.

QUALITY ASSURANCE

Single-Source Responsibility: Provide vinyl window units from one source and produced by a single manufacturer.

Design Concept: The drawings indicate the size, profiles, and dimensional requirements of the vinyl window types required and are based on the specific type and model indicated. Vinyl windows by other manufacturers may be considered provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer. All substitutions must be approved via the process outlined in Section 01631 prior to bidding.

WARRANTY:

Provide manufacturer's standard warranty which agrees to repair or replace units that fail in workmanship for a period of ten years from the original date of purchase.

Warranty includes coverage of materials and labor in full by the manufacturer.

PROJECT CONDITIONS

PART 2 - PRODUCTS

MANUFACTURERS

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

Fixed Windows:

Milgard Tuscan Series PVC Windows

MATERIALS

Vinyl Extrusions: Provide PVC sections as recommended by the window manufacturer for the strength, corrosion resistance, and application of required finish.

Fasteners: Provide PVC, stainless steel, or other materials warranted by the manufacturer to be noncorrosive and compatible with vinyl window members, trim, hardware, anchors, and other components of window units.

Compression-Type Glazing Strips and Weatherstripping: Unless otherwise indicated, and at the manufacturer's option, provide compressible stripping for glazing and Weatherstripping such as molded EPDM or neoprene gaskets complying with AAMA SG-1 or with ASTM D 2000 Designation 2BC415 to 3BC620, or molded PVC gaskets complying with ASTM D 2287, or molded expanded EPDM or neoprene gaskets complying with ASTM C 509, Grade 4.

Sealant: For sealants required within fabricated window units, provide type recommended by the manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating. Comply with Division 7 Section "Joint Sealants" of these specifications for selection and installation of sealants.

ACCESSORIES

General: Provide the manufacturer's standard accessories that comply with indicated standards.

END OF SECTION 08520A

SECTION 08520B

FIXED WINDOWS

Window Grade and Class: Comply with requirements of AAMA Grade A. Supplier shall verify size for egress units at sleeping rooms prior to bidding to ensure compliance. Color shall be either white or almond as selected.

TYPICAL GLAZING ALL EXTERIOR OPENINGS:

3/4" insulated units, with (2) 1/4" panes, low e, argon filled, with clear interior pane and tinted exterior pane selected from the following choices:

Green: Solarban 60 (3) Solargreen, as manufactured by PPG, with a 60% visible light transmittance, and a shading coefficient of 0.46 resulting in an LSG of 1.54.

Tempered: At all locations where required by code.

FABRICATION

General: Fabricate vinyl window units to comply with indicated standards. Include a complete system for assembly of components and anchorage of window units. Provide units that are reglazable without dismantling sash or ventilator framing. Prepare window sash or ventilators for glazing except where preglazing at the factory is indicated. Fabricate framing, mullions, and sash members with mitered and fusion welded corners and joints. Supplement framing sections with internal reinforcement where required for structural rigidity. Trim and finish corners and welds to match adjacent areas. Prepare components to receive anchor devices.

Thermal-Break Construction: Fabricate window units with an integral concealed low-conductance thermal barrier, located between exterior materials and window members exposed on the interior, in a manner that eliminates direct metal-to-metal contact. Provide thermal-break construction that has been in use for not less than 3 years, has been tested to demonstrate resistance to thermal conductance and condensation, and has been tested to show adequate strength and security of glass retention.

Weepholes: Provide weepholes and internal passages to conduct infiltrating water to the exterior.

Preglazed Fabrication: Preglaze window units at the factory where possible and practical for applications indicated. Provide Class A insulated low e glass units, 1" thick, argon filled, U-value 0.40 max., solar-bronze, green, or gray tinted exterior sheet (as selected by architect), clear interior sheet, complying with standards set by specified manufacturers, safety glazing where required by code.

FINISHES

General: PVC, white color, solid, homogeneous.

PART 3 - EXECUTION

INSPECTION

Inspect openings before beginning installation. Verify that rough opening is correct and the sill plate is level. Wood frame walls shall be dry, clean, sound, and well-nailed, free of voids and without offsets at joints. Ensure that nail heads are driven flush with surfaces in the opening and within 3 inches of the opening.

INSTALLATION

Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators, and other components of the work.

Set window units plumb, level, and true to line, without warp or rack of frames or sash. Provide de proper support and anchor securely in place. Separate vinyl and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with the requirements specified under paragraph "Dissimilar Materials" in the Appendix to AAMA 101. Verify 15 felt has been installed as required by architect in shingle style fashion, properly flashing window head.

Set sill members and other members in a bed of compound or with joint fillers or gaskets, as shown, to provide weathertight construction. Refer to the "Joint Sealer" sections of Division 7 for compounds, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the work. Compounds, joint fillers, and gaskets to be installed after installation of window units are specified as work in another section in Division 7.

See details for sequence of installation and location of SAM and building wrap materials.

CLEANING

Clean vinyl surfaces promptly after installation of windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.

Clean glass of preglazed units promptly after installation of windows. Comply with requirements of the "Glass and Glazing" section for cleaning and maintenance. Do not use petroleum distillants to clean windows. Use mild detergent in warm water applied with soft clean wiping cloths as per manufacturer.

PROTECTION

Initiate and maintain protection and other precautions required through the remainder of the construction period, to ensure that, except for normal weathering, window units will be free of damage or deterioration at the time of Substantial Completion.

END OF SECTION 08520

SECTION 08710 - FINISH HARDWARE**PART 1 - GENERAL****RELATED DOCUMENTS:**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to the work of this section.

DESCRIPTION OF WORK:

Definition: "Builders" Hardware includes items known commercially as builder's hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

Extent of finish hardware required is indicated on drawings and in schedules.

Types of finish hardware required include the following:

Hinges

Lock cylinders and keys

Lock and latch sets

Closers

Door trim units

Protection plates

Weatherstripping for exterior doors

Thresholds

Silencers included integral with hollow metal frames are specified with door frames elsewhere in Division 8.

QUALITY ASSURANCE:

Manufacturer: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from only one manufacturer, although several may be indicated as offering products complying with requirements.

Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced **architectural hardware consultant** (AHC) who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor. Supplier shall be a factory direct distributor for specified hardware.

SUBMITTALS:

Product Data: Submit manufacturer's technical product data for each item of hardware in accordance with Division-1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

Hardware Schedule: Submit final hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware. Incomplete, or confusing submittals will be returned without review.

Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:

Type, style, function, size and finish of each hardware item.

Name and manufacturer of each item.

Fastenings and other pertinent information.

Location of hardware set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.

Explanation of all abbreviations, symbols, codes, etc. contained in schedule.

Mounting locations for hardware.

Door and frame sizes and materials.

Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

Keying Schedule: Furnish all lock cylinders, including cabinet locks, to be keyed to match owner's master key system. Subcontractor shall contact owner's representative to verify keying prior to performing work.

Provide construction locks on all exterior doors.

Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

PRODUCT HANDLING:

Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

Packaging of hardware, is responsibility of supplier. As material is received by hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set number to match set numbers of approved hardware schedule. Two or more identical sets may be packed in same container.

Inventory hardware jointly with representatives of the hardware supplier and the hardware installer until each is satisfied that the count is correct.

Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

PART 2 - PRODUCTS

SCHEDULED HARDWARE:

Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following.

Manufacturer's product designations: One or more manufacturers are listed for each hardware type required. An asterisk (*) after a manufacturer's name indicates whose product designation is used in the Hardware Schedule for purposes of establishing minimum requirements. Provide either the product designated, or, where more than one manufacturer is listed, the comparable product of one of the other manufacturers which comply with requirements including those specified elsewhere in this section.

ANSI/BHMA designations used elsewhere in this section or in schedules to describe hardware items or to define quality or function are derived from the following standards. Provide products complying with these standards and requirements specified elsewhere in this section.

Butts and Hinges: ANSI A156.1 (BHMA 101)

Locks & Lock Trim: ANSI A156.2 (BHMA 601)

Exit Devices: ANSI A156.3 (BHMA 701)

Door Controls - Closers: ANSI A156.4 (BHMA 301)

Auxiliary Locks: ANSI A 156.5 (BHMA 501).

Architectural Door Trim: ANSI A156.6 (BHMA 1001)

Template Hinge Dimensions: ANSI A156.7.

Closer Holder Release Devices: ANSI A156.15 (BHMA 321)

Auxiliary Hardware: ANSI A156.16 (BHMA 1201)

Materials & Finishes: ANSI A156.18 (BHMA 1301)

MATERIALS AND FABRICATION:**General:**

Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for the applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.

Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.

Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of the type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on the opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.

Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

HINGES, BUTTS AND PIVOTS:

Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

Steel Hinges: Steel pins.

Exterior Doors: Non-removable pins.

Out-swing Corridor Doors: Non-removable pins.

Interior Doors: Non-rising pins.

Tips: Flat button and matching plug, finished to match leaves, except where hospital tip (HT) indicated.

Number of hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.

LOCK CYLINDERS AND KEYING:

General: Supplier will furnish all locks to be keyed to Owner master system.

Equip locks with manufacturer's standard 6-pin tumbler cylinders.

Manufacturer: Subject to compliance with requirements, provide products of one of the following:

Schlage

Metals: Construct lock cylinder parts from brass.

Key Material: Provide keys of nickel silver only.

Key Quantity: Furnish the following:

- 10 ea. Master Keys
- 5 ea. Change Keys each keyed core
- 5 ea. Construction Master Keys

Deliver keys to Owner's representative.

LOCKS, LATCHES AND BOLTS:

Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.

Lock Throw: Provide 3/4" minimum throw of latch and deadbolts. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

CLOSERS AND DOOR CONTROL DEVICES:

Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.

Access-Free Manual Closers: All manual closers are required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A 117.1 provisions for door opening force and delayed action closing.

Combination Door Closers and Holders: Provide units designed to hold door in open position under normal usage and to release and automatically close door under fire conditions. Incorporate an integral electromagnetic holder mechanism designed for use with UL listed fire detectors, provided with normally closed switching contacts.

Provide integral smoke detector device in combination door closers and holders complying with UL 228.

DOOR TRIM UNITS:

Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screw.

Fabricate edge trim of stainless steel, not more than 1/2" nor less than 1/16" smaller in length than door dimension.

Fabricate protection plates (armor, kick or mop) not more than 1-1/2" less than door width on stop side and not more than 1/2" less than door width on pull side, x the height indicated.

Plastic Plates: Clear acrylic plastic, 1/8" thick (0.125") thick.

WEATHERSTRIPPING:

General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.

Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily available from stocks maintained by manufacturer.

THRESHOLDS:

General: Except as otherwise indicated provide standard metal threshold unit of type, size and profile as shown or scheduled compliant with ADA.

HARDWARE FINISHES:

Provide matching finishes for hardware units at each door or opening, to the greatest extent possible, and except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of hardware exposed at the same door or opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch-lock sets) for color and texture.

Provide finishes which match those established by BHMA and those of the existing hardware located within the building.

Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.

The designations used in schedules and elsewhere to indicate hardware finishes are the industry-recognized standard commercial finishes, except as otherwise noted.

MANUFACTURERS:

Doors and Frames used in positive pressure opening assemblies shall meet UBC 7-2-97 and UL10C in areas where this has been adopted by the local authority having jurisdiction.

The following hardware is designed around Vancouver "S" labeled rated doors. If any other hardware is required by another door manufacturer, that manufacturer shall provide necessary hardware at no additional charge to the owner.

Numbers appearing on Hardware Schedule have been taken from the catalogs of the following manufacturers:

Locksets/Cylinders	SCH	Schlage
Butts	ST	Stanley, equal from Hager
Kickplates	TRI	Trimco G.J., equal from Hager
Stops	I	Ives, equal from Hager
Weather-strip/Threshold	P	Pemko
Push Button Locks	LOC	Locknetics
Others		As indicated

HARDWARE SCHEDULE

GROUP NO.1: Door #1		INSUL HM x HM		
3 ea.	Butts	ST	FBB179 4 1/2 x 4 1/2	630
1 ea.	Lockset	Sch	L9453-03	630
1 set	Seal	P	S44	Clear
1 ea.	KP	TRIMCO	10 x 2-LDW	630
1 ea.	Threshold	P	276A	Alum.
1 ea.	Dr Sweep	P	315CN	

PART 3 – EXECUTION**INSTALLATION:**

Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface -mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant. **Confirm mounting height at doors to pole rooms on second floor.**

ADJUST AND CLEAN:

Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

Clean adjacent surfaces soiled by hardware installation.

Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

END OF SECTION 08710

SECTION 08800A - GLASS AND GLAZING

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

SUMMARY:

Extent of glass and glazing work is indicated on drawings and schedules.

Types of work in this section include glass and glazing for:

Re-Lites and door glazing.

ALL GLAZING SHALL BE TEMPERED AT ALL LOCATIONS.

SYSTEM DESCRIPTION:

Provide glass and glazing that has been produced, fabricated and installed to withstand normal thermal movement, wind loading and impact loading (where applicable), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glass and glazing materials, and other defects in the work.

Deterioration of insulating glass is defined as failure of hermetic seal due to other causes than breakage which results in intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coating, if any, resulting from seal failure, and any other visual evidence of seal failure or performance.

Deterioration of laminated glass is defined as the development of manufacturing defects including edge separation or delamination which materially obstructs vision through glass.

Deterioration of coated glass is defined as the development of manufacturing defects including peeling, cracking or other indications of deterioration in metallic coating due to normal conditions of use.

Certificate: Submit certificates from respective manufacturers attesting that glass and glazing materials furnished for project comply with requirements.

Separate certification will not be required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.

SAMPLES:

Provide sample of glazing for District approval.

QUALITY ASSURANCE:

Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.

Safety Glazing Standard: All glazing shall be safety glass. Provide products which comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category II materials.

Single Source Responsibility for Glass: To ensure consistent quality of appearance and performance, provide materials produced by a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.

Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

Safety Glazing Labeling: Permanently mark glazing with certification label of **the SGCC**. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

1. Install glazing in mockups specified in Division 08 Section "**Aluminum Storefronts**" to match glazing systems required for Project, including glazing methods.

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

Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

Review temporary protection requirements for glazing during and after installation.

DELIVERY, STORAGE, AND HANDLING:

Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

PROJECT CONDITIONS:

Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.

WARRANTY:

General: Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

Warranty Periods: Manufacturer's standard but not less than 10 years after date of substantial completion.

Manufacturer's Special Project Warranty on Insulating Glass: Provide written warranty signed by manufacturer of insulating glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, replacements for those insulating glass units developing manufacturing defects. Manufacturing defects are defined as failure or hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging, deterioration of protected internal glass coatings, if any, and other visual indications of seal failure or performance; provided the manufacturer's instructions for handling, installing, protecting and maintaining units have been complied with during the warranty period.

Warranty Period: Manufacturer's standard but not less than 5 years after date of substantial completion against edge seal failure.

PRECONSTRUCTION TESTING

Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.

Test no fewer than **eight** Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.

Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

PART 2 - PRODUCTS

MANUFACTURERS:

Manufacturer: Subject to compliance with requirements, provide Products of one of the following:

Manufacturers of Tempered Insulating Glass:

Libbey-Owens-Ford Glass Co.

Guardian Industries Corp.

PPG Industries Inc.

GLASS PRODUCTS, GENERAL

Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

Minimum Glass Thickness for Exterior Lites: Not less than 1/4 inch at each pane, with 1/2" space between.

Strength: At fully tempered glass, provide Kind FT heat-treated float glass.

Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.

U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.

Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.

Visible Reflectance: Center-of-glazing values, according to NFRC 300.

Heat-Treated Glass Standard: Provide heat-treated glass which complies with ASTM C 1048 requirements, including those indicated by reference to kind, condition, type, quality, class, and, if applicable, form, finish, and pattern.

Sizes: Fabricate glass to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer. Provide thicknesses indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.

HEAT-TREATED GLASS PRODUCTS:

Manufacturing Process: Manufacture heat-treated glass as follows:

By horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed, unless otherwise indicated.

By vertical (tong-held) or horizontal (roller hearth) process, at manufacturer's option, except provide horizontal process where indicated as "tongless" or "free of tong marks".

Uncoated Clear Heat-Treated Float Glass: Condition A (uncoated surfaces), Type 1 (transparent glass, flat), Class1 (clear), Quality q3 (glazing select), kind as indicated below.

Kind FT (fully tempered) at all locations.

END OF PART A - SECTION 08800

PART B - SECTION 08800 – GLAZING**INSULATING GLASS****SEALED INSULATING GLASS UNITS:**

General: Provide preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E 774 for performance classification indicated as well as with other requirements specified for glass characteristics, air space, sealing system, sealant, spacer material, corner design and dessicant.

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

Libbey-Owens-Ford Glass Co.
Guardian Industries Corp.
PPG Industries Inc.

Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.

For properties of individual glass panes making up units, refer to product requirements specified elsewhere in this section applicable to types, classes, kinds and conditions of glass products indicated.

Provide heat-treated panes of kind and at locations indicated or, if not indicated, provide heat-strengthened panes where recommended by manufacturer for application indicated and tempered where indicated or where safety glass is designated or required.

Performance characteristics designated for coated insulating glass are nominal values based on manufacturer's published test data for units with 1/4" thick panes of glass and 1/2" thick air space.

U-values indicated are expressed in the number of Btu's per hour per sq. ft. per degree F difference.

Performance Classification per ASTM E 774 ASTM E2190, E2188, & E2189: Class A., Guardian SunGuard, SuperNeutral 68 on Clear Low E#2.; visible light transmittance = 67% min.; Winter nighttime U-Value = 0.29 max; Summer Daytime U-value = 0.27 max, shading coefficient =0.44 max; Solar heat gain coefficient = 0.37 max.

Panes: 1/4" thick exterior and interior, clear float glass, tempered, meeting CSI Standard C1048. Guardian SunGuard, SuperNeutral 68 on Clear Low E#2.

Air Space Thickness: 1/2".

Sealing System: Manufacturer's standard.

Spacer Material: Manufacturer's standard metal.

Dessicant: Manufacturer's standard; either molecular sieve or silica gel or blend of both.

Corner Construction: Manufacturer's standard corner construction.

GLAZING SEALANTS & MATERIALS:

General: Provide products of type indicated and complying with the following requirements:

Compatibility: Select glazing sealants and tapes of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.

Suitability: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.

Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.

Colors: Provide color of exposed sealants indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

Sealants: See Section 07900A & B.

Glazing Tape method of sealing juncture or glazing to frame opposite to window frame stops required. Butyl and other caulks are prohibited without prior approval of the District.

MISCELLANEOUS GLAZING MATERIALS:

Compatibility: Provide materials with proven record of compatibility with surfaces contacted in installation.

Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.

Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.

Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.

Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.

PART 3 - EXECUTION**EXAMINATION:**

Require Glazier to inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Obtain Glazier's written report listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

PREPARATION:

Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

GLAZING, GENERAL:

Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.

Glazing channel dimensions as indicated in details are intended to provide for necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation.

Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening. Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.

Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

GLAZING:

Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 6" from corner, unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.

Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.

Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

Tool exposed surfaces of sealants to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement.

Miter cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent pull away at corners; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

PROTECTION AND CLEANING:

Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.

Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.

Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.

Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

Wash glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Wash glass by method recommended by glass manufacturer.

END OF SECTION 08800

SECTION 09900 - PAINTING**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

SUMMARY

This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.

Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.

Provide painting and surface preparation for all exterior surfaces, including mechanical and electrical equipment. Provide painting at all new interior surfaces and at all areas disturbed by construction operations. Paint such disturbed areas as required to provide a complete match back to appropriate break points. The location and sizes of these patches may be determined by the General Contractor and cannot be shown in completeness on these documents. Therefore, coordinate with the General Contractor is required to identify all patched areas as a part of the work.

Paint exposed surfaces whether or not colors are designated in "schedules," except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.

Painting includes field painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

Painting is not required on prefinished items unless noted, finished metal surfaces, concealed surfaces, operating parts, and labels.

Prefinished items not to be painted include the following factory-finished components:

- Metal toilet enclosures.
- Acoustic materials.
- Architectural casework.
- Finished mechanical and electrical equipment.
- Light fixtures.
- Switchgear.
- Distribution cabinets.

Concealed surfaces not to be painted include wall or ceiling surfaces in the following generally inaccessible areas:

- Furred areas.
- Pipe spaces.
- Duct shafts.

Finished metal surfaces not to be painted include:

Anodized aluminum.
Stainless steel.
Chromium plate.
Copper.
Bronze.
Brass.

Operating parts not to be painted include moving parts of operating equipment such as the following:

Valve and damper operators.
Linkages.
Sensing devices.
Motor and fan shafts.

Labels: Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

Related Sections: The following sections contain requirements that relate to this section:

Division 6 Section "Architectural Woodwork" for shop priming architectural woodwork.

Division 6 Section "Finish Carpentry" for siding and trim.

Division 7 Section 7 "Joint Sealants" for sealants.

DEFINITIONS

"Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

SUBMITTALS

Product Data: Manufacturer's technical information, label analysis, and application instructions for each material proposed for use.

List each material and cross-reference the specific coating and finish system and application. Identify each material by the manufacturer's catalog number and general classification.

Samples for initial color selection in the form of manufacturer's color charts.

After color selection, the Architect will furnish color chips for surfaces to be coated.

Samples for verification purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate. Define each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.

Provide a list of material and application for each coat of each sample. Label each sample as to location and application.

Submit samples on the following substrates for the Architect's review of color and texture only:

Painted Wood: Provide two 12- by 12-inch samples of each color and material on specified wood.

QUALITY ASSURANCE

Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

Applicator:

Company specializing in commercial painting special coatings and finishing with five years experience.

Use only qualified journeyman painters for the mixing and application of paint on exposed surfaces.

In the acceptance or rejection of installed painting, no allowance will be made for lack of skill on the part of painters.

Conform to recommendations of the PDCA (Painting and Decorating Contractors of America) and SSPC (Steel structures Painting Council) manuals.

Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

Notify the Architect of problems anticipated using the materials specified.

Material Quality: Provide the manufacturer's contractors line paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.

Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude equal products of other manufacturers.

DELIVERY, STORAGE, AND HANDLING

Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

Product name or title of material.

Product description (generic classification or binder type). Federal Specification number, if applicable.

Manufacturer's stock number and date of manufacture. Contents by volume, for pigment and vehicle constituents. Thinning instructions.

Application instructions.

Color name and number.

Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue. Store in area directed by the General Contractor.

Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

JOB CONDITIONS

Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).

Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).

Do not apply paint in snow, rain, fog, or mist, when the 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.

Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

Provide continuous ventilation and heating facilities to maintain surface and ambient temperature above 45 deg F for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturers instructions.

Do not work:

Where dust or insects are present.

Where inclement weather may damage coating surface.

When relative humidity is above 85%.

On damaged or wet surfaces. (report immediately to general contractor)

With less than 30 foot candles of lighting measured mid-height of working surface.

EXTRA STOCK: Provide two gallons in unopened, original container of each color and surface texture to Owner, minimum. Label each container with color, color mix formula, texture and room locations, in addition to the manufacturer's label.

COLORS: Provide draw downs of all colors selected on 8.5 x 11 standard sheets for control samples. Keep one set of approved draw downs on the job at all times. Colors will be selected based on full range of colors provide by manufacturer. Colors may vary between classroom pods and shall be provided at no additional cost.

PART 2 - PRODUCTS

MANUFACTURERS

Manufacturer: Subject to compliance with requirements, provide products of one of the following: (If specific product not listed for each mfr., submit equal product to architect for approval prior to bidding)

Rodda Paint Co. (basis of design)
Pittsburgh
Miller

PRIMERS

Latex-Based Interior White Primer: Latex-based primer coating used on interior gypsum drywall under a flat latex paint or an alkyd semigloss enamel.

Rodda: Rodda Scotseal #507801x

Synthetic, Rust-Inhibiting Primer: Quick-drying, rust-inhibiting primer for priming ferrous metal on the exterior under full-gloss and flat alkyd enamel and on the interior under flat latex paint or odorless alkyd semigloss or alkyd gloss enamels:

Rodda: Rodda Barrier III #708201X

Galvanized Metal Primer: Primer used to prime interior and exterior zinc-coated (galvanized) metal surfaces:

Rodda: Rodda Galva-Cling #74079X

Exterior Primer Coating: Exterior alkyd wood primer for priming wood & under latex or alkyd gloss enamels, flat lusterless finish, and wood trim under medium shade or deep color high-gloss alkyds:

Rodda: Rodda Control Primer #701501X

UNDERCOAT MATERIALS

Interior Enamel Undercoat: Ready-mixed enamel for use as an undercoat over a primer on ferrous or zinc-coated metal under an interior alkyd semigloss enamel or a full-gloss alkyd enamel:

Rodda: Rodda Speed Primer #702901X.

EXTERIOR FINISH PAINT MATERIAL

Exterior Acrylic Semi-Gloss Latex: A latex house and trim paint for wood surfaces and primed surfaces.

Rodda: Rodda Unique II Semi Gloss #542001X

Exterior Alkyd Semi-Gloss: A oil based alkyd enamel house and trim paint for wood surfaces and primed surfaces, and metal doors and frames.

Rodda: Rodda Porsalite Semi-Gloss #74500X.

INTERIOR FINISH PAINT MATERIAL

Interior Latex Eggshell Enamel: A premium quality water-thinned, vinyl acrylic latex enamel for interior use on new or previously painted wallboard, plaster or masonry surfaces; primed or previously painted wood and metal.

Rodda: Rodda Lasyn Eggshell #533001X.

Interior Semi-Gloss Alkyd Enamel: A premium quality soy alkyd semi-gloss enamel for interior use on new or previously painted hollow metal doors and frames or other metal surfaces.

Rodda: Rodda Porsalite Semi-Gloss #795001X.

SOURCE QUALITY CONTROL

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

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint

materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

END OF PART A - SECTION 09900

PART B - SECTION 09900

PART 3 - EXECUTION

EXAMINATION

Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint. Do not begin paint application until unsatisfactory conditions have been corrected.

Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

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.
4. Portland Cement Plaster: 12 percent.
5. Gypsum Board: 12 percent.

Portland Cement Plaster Substrates: Verify that plaster is fully cured.

Exterior Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

Proceed with coating application only after unsatisfactory conditions have been corrected.

Application of coating indicates acceptance of surfaces and conditions.

PREPARATION

General Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer's instructions for each particular substrate condition and as specified.

Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing of problems anticipated with using the specified finish-coat material with substrates primed by others.

Cementitious Materials: Prepare concrete, concrete masonry blocks, cement plaster, exterior insulation and finish systems, and mineral-fiber reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

Use abrasive blast-cleaning methods if recommended by the paint manufacturer.

Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturers printed directions.

Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.

Gypsum Board: Clean surfaces of dirt, oil, and other foreign substances as required. Sand surfaces exposed to view smooth and dust off. **Prime gypsum board prior to receiving texture coat, and have architect inspect to verify coverage,** and again after texture coat has been applied. Verify that no bleeding through of taped joints are visible prior to proceeding with finish coats.

Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.

Blast steel surfaces clean as recommended by the paint system manufacturer and in accordance with requirements of SSPC specification SSPC-SP 3.

Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.

Galvanized Surfaces: Clean galvanized surfaces with non-petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

Materials Preparation: Carefully mix and prepare paint materials in accordance with manufacturer's directions. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

Use only thinners approved by the paint manufacturer, and only within recommended limits.

APPLICATION

Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

Paint colors, surface treatments, and finishes are indicated in "schedules."

Provide finish coats that are compatible with primers used.

The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer's directions.

Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.

The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.

Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.

Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.

Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

Finish exterior doors on tops, bottoms, and side edges same as exterior faces.

Sand lightly between each succeeding enamel and varnish coat.

Omit primer on metal surfaces that have been shop-primed and touch up painted.

Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.

Mechanical and Electrical Work: Painting mechanical and electrical work is limited to items exposed in mechanical equipment rooms and in occupied spaces.

Mechanical items to be painted include but are not limited to:

Piping, pipe hangers, and supports.
Supports.

Electrical items to be painted include but are not limited to: Conduit and fittings.

Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.

Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

FIELD QUALITY CONTROL

Before proceeding with remaining Work, request Architect to inspect each first finished Room, Space, Condition, and item for acceptability.

The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:

The Owner will engage the services of an independent testing laboratory to sample the paint material being used. Samples of material delivered to the project will be taken, identified, sealed, and certified in the presence of the Contractor.

The testing laboratory will perform appropriate tests for the following characteristics as required by the Owner:

- Quantitative materials analysis.
- Abrasion resistance.
- Apparent reflectivity.
- Flexibility.
- Washability.
- Absorption.
- Accelerated weathering.
- Dry opacity.
- Accelerated yellowness.
- Recoating.
- Skinning.
- Color retention.
- Alkali and mildew resistance.

If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are noncompatible.

CLEANING

Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

Upon completion of painting, clean paint-spattered surfaces, including glass. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

PROTECTION

Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

EXTERIOR PAINT SCHEDULE

General: Provide the following paint systems for the various substrates indicated. **All previously painted surfaces shall be prepared as specified above, and primed with primer recommended by manufacturer of the appropriate finish coating.**

Ferrous Metal: Primer is not required on shop-primed items.

Full-Gloss Alkyd Enamel: 2 finish coats over primer.

Primer: Synthetic Rust-Inhibiting Primer (FS TT-P-664).

First Coat: Exterior Semi-Gloss Enamel (FS TT-E-489).

Second Coat: Exterior Semi-Gloss Enamel (FS TT-E-489).

Zinc-Coated Metal:

High-Gloss Alkyd Enamel: 2 finish coats over primer.

Primer: Galvanized Metal Primer (FS TT-P-641).

First Coat: Exterior Semi-Gloss Enamel (FS TT-E-489).

Second Coat: Exterior Semi-Gloss Enamel (FS TT-E-489).

Painted Wood Soffits & Trim:

Acrylic Latex Satin Paint Finish:

2 finish coats total, over primer. 3 coats at unprimed wood.

Backpriming, and primer shall be factory applied. Provide backprime and primer for 2x trim and touch up primer and backprimer at all cuts, as an additional coat. Finish coats shall be exterior acrylic latex satin paint. All coats shall be spray applied and backrolled.

Painted Cement Siding:

Acrylic Latex Satin Paint Finish:

2 finish coats total, over primer. 3 coats at unprimed product. Backpriming, and primer shall be factory applied. Provide backprime and primer for 2x trim and touch up primer and backprimer at all cuts, as an additional coat. Finish coats shall be exterior acrylic latex satin paint. All coats shall be spray applied and backrolled, and or brushed.

INTERIOR PAINT SCHEDULE

General: Provide the following paint systems for the various substrates, as indicated. Painting work shall match existing and shall include entire wall or surface up to an appropriate break point as approved by the architect.

Gypsum Drywall Systems:

Interior Latex Eggshell Enamel Finish: 4 coats with total dry film thickness not less than 2.8 mils @ new gypsum board. 2 coats at existing previously painted gypsum board or plaster.

<u>Primer prior to Texture:</u>	Interior Latex-Based White Primer (FS TT-P-65 0).
<u>Primer after Texture:</u>	Interior Latex-Based White Primer (FS TT-P-650).
<u>First Coat:</u>	Interior Latex-Based Eggshell Enamel (FS TT-P-650).
<u>Second Coat:</u>	Interior Latex-Based Eggshell Enamel (FS TT-P-650).

Ferrous Metal: Semigloss Enamel Finish: 2 coats over primer with total dry film thickness not less than 2.5 mils. @ Existing metal door frames or doors. Sand existing doors down prior to painting to ensure operation is smooth upon completion.

<u>Primer:</u>	Synthetic Rust-Inhibiting Primer (FS TT-P-664).
<u>Undercoat:</u>	Interior Enamel Undercoat (FS TT-E-543).
<u>Finish Coat:</u>	Interior Semigloss Odorless Alkyd Enamel (FS TT-E-509).

END OF SECTION 09900

SECTION 12490 - WINDOW TREATMENT**PART 1 - GENERAL****RELATED DOCUMENTS**

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

SUMMARY

This Section includes basic window treatment as follows:

Remove existing window coverings and install new Horizontal blinds @ all new windows except main entry door.

SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Product data and installation instructions for each type of window treatment unit required. Include methods of installation for each kind of opening and supporting structure.

Shop drawings for special components and application conditions that are not fully dimensioned or detailed in manufacturers' product data. Show relationships to adjoining work.

Include typical elevation layout indicating proposed division between blind units and meeting edges at corners. Provide sections and details at head and sill between blind units and corners including inclined installations.

Provide schedule of all units to be furnished, including field measurements at each location.

Samples for initial selection of colors, in form of manufacturers' color charts consisting of sections of exposed components with integral or applied finishes showing full range of colors and materials.

Samples for verification purposes, in full-size units of each component, material, and finish to be exposed to view, for each type of window treatment required. Prepare samples from same materials to be used for fabricating units.

In addition, submit one complete small operating unit for each type of window treatment required.

QUALITY ASSURANCE

General: Provide units produced by one manufacturer for each type required, with complete standard assemblies including hardware accessory items, mounting brackets, and fastenings.

Furnish materials in colors and patterns selected by Architect from manufacturers' standard colors/patterns.

Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

Installers Qualifications:

Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the referenced standards and the requirements of this Work, and who shall personally direct all installation performed under this Section of these Specifications.

EXTRA MATERIALS

Maintenance Stock: Furnish extra materials matching products installed, packaged with protective covering for storage and identified with labels clearly describing contents.

Typical Window Treatment Units: Furnish quantity of full-size typical window treatment units equal to 5 percent of amount installed.

PART 2 - PRODUCTS

HORIZONTAL BLINDS

The design for this Work is based on Levolor "Riviera DustGuard" Blinds, with 1" wide aluminum slats, transparent tilt control wand, and cord lift controls. Other acceptable manufacturers include Bali, Classic 3000; Hunter Douglas Louver Drape; or approved.

Louver Slats: One inch wide, 0.006" thick magnesium aluminum alloy horizontal slats, with manufacturing burrs removed, anti-static coating, and radiused slat corners, unperforated.

Provide slats designed and spaced to achieve maximum overlap and closure for optimum light exclusion.

Slat Support: Support slats at nominal 15.7 slats per vertical foot.

Headrail Housing: Prefinished U shaped 1" high x 1 9/16" wide formed aluminum box with internally fitted hardware, pulleys, and bearings for blind operations.

Cord: Braided nylon, continuous loop, free end.

Control Wand: Solid plastic, transparent, with hexagonal cross section. For windows and relites: non-removable type, length of window opening height, less 12" unless longer length is required to allow operation from floor level.

Shaft Type Tilter: Worm and gear arrangement in an enclosed gear case (housing), worm (tiltershaft), smooth operation and hold slats at any angle with no movement or vibration.

Head Support Bracket: Overhead head rail housing attachment.

Accessory Hardware: Type recommended by blind manufacturer.

Color: As selected by Architect from manufacturer's full line of standard colors.

Embossed metal bottom rail:

Tubular shaped, baked enamel finish, rolled formed with
Locking groove to receive dust cover, and molded end caps.

FABRICATION AND OPERATION

Prior to fabrication, verify actual opening dimensions by accurate site measurements. Adjust dimensions for proper fit at openings.

Coordinate with other trades for securing tracks to substrates and other finished surfaces.

Fabricate window treatment components from noncorrosive, nonstaining, nonfading materials that are completely compatible and do not require lubrication during normal expected life.

Fabricate blind units to openings fill openings from head to sill and jamb to jamb.

For continuous window wall installations, fabricate blinds so that ends occur only over mullions or other defined vertical separation.

Space slats to provide overlap for light exclusion when fully closed.

PART 3 - EXECUTION

INSTALLATION

General: Install window treatment units to comply with manufacturer's instructions. Position units level, plumb, secure, and at proper height and location relative to adjoining window units and other related work. Securely anchor units with clips, brackets, and anchorages suited to type of substrate.

Provide clearance between sash and blinds to permit unencumbered operation of sash hardware.

Isolate metal parts from concrete and mortar to prevent galvanic action. Use thick coating or other means recommended by manufacturer to effect separation.

Protect installed units to ensure their being in operating condition, without damage, blemishes, or indication of use at substantial completion of project. Correct nonconforming damaged units. Replace units that cannot be field corrected.

Provide intermediate support units where required.

Locate controls for convenient operation, as directed.

ADJUST and CLEANING

Adjust clearances and overlaps to ensure free operation.

Repair damaged items with new material.

Repair surfaces damaged by improper installation.

Clean soiled blind surfaces and components.

Leave blinds in true alignment and operating smoothly, without binding.

SCHEDULE

Provide blinds as per the following:

At all interior through wall windows to the exterior that been replaced by this project.

END OF SECTION 12500

WINDOW TREATMENT 12490-4

SECTION 15050 - BASIC MECHANICAL MATERIALS & METHODS

PART 1 - GENERAL

DESCRIPTION

Requirements Included: Provide all materials, labor and equipment required to install complete mechanical work.

QUALITY ASSURANCE

Codes and Standards: Comply with the provisions of the following codes, standards and specifications, except where more stringent requirements are shown or specified:

- State of Oregon Structural Specialty Code.
- State of Oregon Mechanical Specialty Code.
- State of Oregon Plumbing Specialty Code.
- State of Oregon Uniform Fire Code.
- NFPA and other Standards referenced in the above codes.

Permits, Licenses, Fees, and Taxes: Obtain and pay for all licenses, fees and taxes applicable to this project as required by law. Permits are being paid by Owner.

Drawings: Do not scale drawings for roughing-in measurements, nor use as shop drawings. Make field measurements and prepare shop drawings as required. Coordinate work with shop drawings of other specification divisions.

Field Wiring: It is the intent of these specifications that all systems shall be complete and operable. Refer to all drawings and specifications, especially the electrical drawings, to determine voltage, phase, circuit ampacity and number of connections provided. Provide all necessary field wiring and devices from the point of connection indicated on the electrical drawings. All equipment shall be installed in compliance with the Electrical Code and the equipment's UL listing. Bring to the attention of the Architect in writing, all conflicts, incompatibilities, and/or discrepancies prior to bid or as soon as discovered.

SUBMITTALS

Installation Submittals: Submit all equipment submittals bound together in groups. Deliver all at one time. Clearly indicate which model, size, style and options are to be provided. Arrangement of mechanical equipment has been based on items of specific manufacturer intended as somewhat typical of several makes which may be approved.

Wiring Diagrams: Submit complete wiring diagrams showing field-installed wiring and devices for all equipment requiring same.

Submittal Review: Comply with the contract documents where deviations, discrepancies, and conflicts between the submittals and the contract documents are discovered prior to or after the review process.

Project Record (As-Installed) Drawings:

- Obtain and pay for reproducible drawings or electronic media from Architect.

Keep Drawings clean, undamaged, and up to date.

Record and accurately indicate the following:

Depths, sizes, and locations of all buried and concealed piping.

Locations of all clean-outs.

Changes, additions, and revisions due to change orders, obstructions, etc. Eradicate extraneous information.

Locations of tracer wire terminal points.

Make Drawings available when requested by Architect for review.

Submit as part of the required Project Closeout documents. Final submittal will be in the form of reproducible drawings.

Quality of entire set of project record drawings to match the quality of the contract documents; quality to be judged by Architect. Use standards set in contract documents. Note field modifications, all addenda and change order items on project record drawings. If deficiencies are found in either the quality or the accuracy of the drawings, they will be returned unapproved. Additional review of subsequent submissions shall be at the contractor's expense.

Instructions, including manufacturer's service data, wiring diagrams and parts lists for all major items of equipment, valve charts, balancing data, final control diagrams showing final set points, and any additional equipment added by change order, bound in three-ring, vinyl or canvas covered, loose-leaf binders organized with index and thumb-tab markers for each classification of equipment or data.

Instruction Manual: Submit separate Instruction Manual 30 days prior to scheduling the required Instruction Period. Include the following:

Description of each system and operational sequences.

Seasonal system adjustments.

Description and normal settings for time clocks, thermostats, fan and other motor switches, etc.

Normal valve settings.

Emergency measures upon system failure.

Cross reference information furnished by manufacturer in the Operating and Maintenance Manual above.

STORAGE AND HANDLING

Delivery: Deliver to project site with manufacturer's labels intact and legible.

Handling: Avoid damage.

Storage: Inside protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

PART 2 - PRODUCTS**GENERAL**

General: Provide all new materials and equipment, identical to apparatus or equipment in successful operation for a minimum of two 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.

Compatibility: Provide products which are compatible with other portions of the work and provide products with the proper or correct power and fuel-burning characteristics, and similar adaptations for the project.

ACCESS PANELS

Manufacturers: Milcor, Bilco, Elmdor, Karp, Potter-Roemer or accepted substitute. Milcor Style DW, K, or M panels as required by construction.

Construction: Fire rated in fire rated partitions and ceilings. Provide flush key cylinder locks on all access panels less than 8' above the floor in public spaces. Turn keys over to owners at project completion. Screwdriver latches on all others.

MISCELLANEOUS STEEL

General: Provide all steel as required for adequate support of all mechanical equipment, standard angle or channel, I or H sections as required by application. Provide shop drawings of supports especially constructed for this project. Adequately cross braced and welded pipe stands may be used for supports. Provide suitable base plates for all stands and anchors for all hanging equipment. Drill or burn support holes in center line of web of structural shapes only, and in only one leg of any one angle, and as far from center of length as possible.

Paint: Apply one coat of black Rustoleum primer to shop fabricated items before delivery to job; other painting as specified herein.

IDENTIFICATION MARKERS

Pipe Markers:

Adhesive pipe markers of width, letter size and background color conforming to UMC Standard 11-2.

Acceptable Manufacturers: Brady B350 with banding tape or similar Seaton, Zeston, MSI.

Nameplates:

Engraved nameplates, 1/16" thick, laminated 3-ply plastic, center ply white, outer ply black, letters formed by exposing center ply.

Size: 3" by 5" nameplates with 1/4" high letters.

PART 3 - EXECUTION**LAYOUT AND COORDINATION**

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, roughing-in dimensions and equipment locations before proceeding with any of the work.

Utility Locations: The location of all utilities, wires, conduits, pipes, ducts, or other service facilities are shown in a general way only on the Drawings and are taken from existing public records. Ascertain whether any additional facilities other than those shown on the plans may be present and determine the exact location and elevations of all utilities prior to commencing installation.

Sleeves, Inserts, Cast-in-Place Work: Provide sleeves, inserts, anchoring devices, cast-in-place work, etc. which must be set in concrete sequenced at the proper time for the project schedule.

Coordination:

Where the work must be sequenced and positioned with precision in order to fit into the available space, prepare accurate scale shop drawings showing the actual physical dimensions required for the installation and submit prior to purchase-fabrication-installation of any of the elements involved in the coordination.

Cooperate with other trades in furnishing material and information for sleeves, bucks, chases, mountings, backing, foundations and wiring required for installation of mechanical items.

Coordinate all work with other trades and determine in advance where interfacing of the mechanical work and other work are required to be connected together. Provide all materials and equipment to make those connections. Submit shop drawings showing required connections where special conditions exist.

Discrepancies: Report immediately any error, conflict or discrepancy in Plans, Specifications and/or existing conditions. Do not proceed with any questionable items of work until clarification of same has been made. Should rearrangement or re-routing of ducts or piping be necessary, provide for approval the simplest layout possible for that particular portion of the work.

MECHANICAL EQUIPMENT WIRING

Provide all mechanical equipment motors, automatic temperature, limit, float and similar control devices required, with wiring complete from power source indicated on Electrical Drawings.

Provide properly rated motor overload and undervoltage protection and all manual or automatic motor operating devices for all mechanical equipment.

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 including controls for the actual selected equipment/system.

INSTALLATION

Locating and Positioning Equipment: Observe all Codes, Regulations and good common practice in locating and installing mechanical equipment and material so that completed installation presents the least possible hazard. Maintain adequate clearances for repair and service to all equipment and comply with Code requirements.

Arrangement: Arrange ductwork and piping parallel with primary lines of the building construction, and with a minimum of 7' overhead clearance in all areas where possible. Unless indicated otherwise, conceal all piping and ductwork. Locate operating and control equipment properly to provide easy access, and arrange entire mechanical work with adequate access for operation and maintenance. Give right-of-way to piping which must slope for drainage. Set all equipment level or as recommended by manufacturer. Under no conditions shall beams, girders, footings or columns be cut for mechanical items. Casting of pipes into concrete is prohibited unless so shown on Drawings.

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.

Drip Pans: Provide drip pans under all cooling coils. Locate pan immediately below piping and equipment, and extend a minimum of 6" on each side and lengthwise 18" beyond equipment being protected. Fabricate pans 2" deep, of reinforced sheet metal (20 gauge copper, or 16 gauge steel with 2 ounces zinc finish hot dipped after fabrication) with rolled edges and soldered or welded seams. Provide 3/4" copper drainage piping, properly discharged to over floor drain or as shown on the Drawings. Comply with Mechanical Code Section 310 for overflow protection and pipe sizing.

Access Panels: Provide access panels with proper backing reinforcement for all equipment, fire and smoke dampers, dielectric unions and valves requiring service and installed above ceilings, behind walls, or in furring, complete with correct frame for type of building construction involved. Exact size, number and location of access panels are not necessarily shown on Drawings. Use no panel smaller than 12" by 12" for simple manual access or smaller than 16" x 20" where personnel must pass through.

Adjusting: Adjust and calibrate all automatic mechanical equipment, mixing valves, flush valves, float devices, etc. Adjust flow rates at each piece of equipment or fixture.

Building Vapor Barrier: Wherever the building insulation vapor barrier is penetrated by mechanical piping, hangers, conduits, ductwork, etc., provide clear self-adhesive tape recommended by the insulation manufacturer around the penetrations.

Mechanical System Identification:

Piping System: Indicate each pipe system by its generic name (abbreviated) as shown/scheduled/specified; except vent and drainage piping. Comply with UMC Standard 11-2 / ANSI A13.1 for marker locations, letter sizes, and colors. Include arrows to show direction of flow and "Electric Traced" signs to identify heat cable wrapped piping.

Valve Identification: Tag all valves with brass disc and chain. Prepare valve charts indicating valve number, size, location, function and normal position. Use no duplicate numbers in Plumbing and Heating systems. Mount glazed frames containing one set of valve charts in the building as directed.

Equipment: Provide engraved plastic-laminate signs at location of major equipment, primary control devices, emergency equipment, dangerous elements of the mechanical work and similar places. Provide text of sufficient clarity and lettering, of sufficient size to convey adequate information at each location, and permanently mount in an appropriate and effective location. For systems with multiple rooftop HVAC units, comply with OMSC 304.5. Comply with recognized industry standards for color and design.

PROTECTION

Protect all work and materials against loss or damage. Close all pipe openings with caps or plugs. At final completion, thoroughly clean and deliver all work and equipment in an unblemished new condition. Keep all motors and bearings in watertight and dustproof covers during entire course of installation.

Protect floors, walls, framing and sheathing where pipe cutting and threading operations are conducted with plastic sheeting under plywood sheets. Extend plastic sheeting beyond the plywood. Clean-up metal cuttings, oil, etc., daily or as necessary to prevent debris from being tracked beyond the protected area. Damages, as determined by the Architect, due to the pipe cutting/threading operation shall be repaired by the responsible trade.

CUTTING AND PATCHING

other work to accommodate the installation of mechanical work. Do all necessary cutting and patching of existing building and yard surfaces required for completion of the mechanical work. Patch to match finish and color of adjacent surfaces.

MECHANICAL PAINTING

Minimum Requirements: All mechanical equipment, piping, insulation, etc., exposed in finished areas, storage rooms and other locations except mechanical equipment rooms will be painted under Section 09900.

Painting Materials: Material shall comply with Section 09900, Painting.

TEMPORARY HEATING

Comply with requirements of Division 1.

Permanent mechanical systems' equipment utilized for temporary heating, ventilating and cooling shall be started with all controls and safeties installed and operational. Start-up shall be done by a factory approved mechanic only.

Owner's warranties shall not be abridged by contractor's use of the permanent systems' equipment prior to final acceptance. Warranty period shall begin at final completion.

MECHANICAL WORK CLOSEOUT

General: Refer to the Division 1 sections for general closeout requirements. Calibrate all equipment requiring same.

Record Drawings: Submit record set of drawings as previously specified in this Section.

Closeout Equipment/Systems Operations: Sequence operations properly so that work of project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment and each system in a test run of appropriate duration with the Architect present, and with the Owner's operating personnel present, to demonstrate sustained, satisfactory performance. Adjust and correct operations as required for proper performance. Clean and lubricate each system, and replace dirty filters, excessively worn parts and similar expendable items of the work.

Operating Instructions: Conduct a full walk-through instruction seminar for the Owner's personnel who are to be involved in the continued operation and maintenance of mechanical equipment and systems. Provide written instructions outlining and explaining the identification system, operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety, efficiency and similar features of the systems.

END OF SECTION 15050

SECTION 15060 - PIPES & PIPE FITTINGS

PART 1 - GENERAL

DESCRIPTION

Provide pipe, pipe fittings and related items required for complete piping system.

Related Work: Specified in Section 15090, Supports and Anchors, and in Section 15100, Valves.

QUALITY ASSURANCE

General: ASTM and ANSI Standards are indicated. In addition, special standards are referenced where neither ASTM nor ANSI Standards are applicable.

Concealed Plastic Piping: No concealed plastic piping inside the building unless approved by Code or Governing Authorities.

Definitions: Where piping fluid is not indicated in the following paragraphs, provide similar piping materials for similar fluids (i.e., "make-up water" = "domestic water"; "wet stand pipe" = "fire sprinkler pipe"; "drainage piping" = "sanitary/storm sewer piping").

STORAGE AND HANDLING

Deliver materials to the project site with galvanized pipe manufacturer's labels intact and legible as required by code.

Provide factory-applied end caps on each length of pipe and tube. Maintain end caps through shipping, storage and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube. Protect flanges and fittings from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

PART 2 - PRODUCTS

PIPING MATERIALS

Copper Pipe and Tube:

Application:

Cooling Coil condensate drain where subject to damage.

Pipe: ASTM B88.

Above Ground Domestic Water: Type L hard temper copper with soldered joints.

Fittings: Wrought copper solder-joint fittings, ANSI B16.22.

Plastic Pipe:

Application:

Cooling coil condensate drain where protected from damage.

Pipe:

Polyvinyl Chloride Plastic Pipe for Water Service: SDR-PR pipe, ASTM D2241; Schedules 40, ASTM D1785.

Fittings: Provide fittings of the type indicated, matching piping manufacturer. Where not otherwise indicated, provide socket style, solvent weld fittings produced and recommended by the piping manufacturer for the service indicated.

MISCELLANEOUS PIPING MATERIALS/PRODUCTS

Soldering and Brazing Materials: Provide soldering materials as determined by the installer to comply with installation requirements.

Tin-Antimony Solder: ASTM B32, Grade 95TA.

Lead-Free Solder: ASTM B32, Grade HB. Harris "Bridgit" approved.

Silver Solder: ASTM B32, Grade 96.5TS.

PART 3 - EXECUTION**PIPE INSTALLATION**

Piping Runs: Route piping close to and parallel with walls, overhead construction, columns and other structural and permanent-enclosure elements of the building (pitched for drainage). If not otherwise indicated, run piping in the shortest route which does not obstruct usable space or block access for servicing the building or equipment and avoid diagonal runs. Wherever possible in finished and occupied spaces, conceal piping from view. Do not encase horizontal runs in solid partitions.

PIPING JOINTS

General: Provide joints of the type indicated in each piping system, and where piping and joint as manufactured form a system, utilize only that manufacturer's material.

Solder Copper Tube and Fitting Joints: In accordance with recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings. Apply solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in a manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens. "T-Drill" field formed tees may be utilized where the main is at least two pipe sizes larger than the branch.

Braze Copper Tube and Fitting Joints: Where indicated, in accordance with ANSI/ASME B31.5. Pass a slow stream of dry nitrogen gas through the tubing at all times while brazing to eliminate formation of copper oxide.

Changes in Direction: Use fittings for all changes in direction. Run lines parallel with building surfaces.

Line Grades:

Drainage Lines: Run at maximum possible grade and in no case less than 3/16" per foot within building.

Unions and Flanges: At all equipment to permit dismantling and elsewhere as consistent with good installation practice.

Expansion: Provide loops, swing joints, anchors, runouts and spring pieces to prevent damage to piping or equipment.

END OF SECTION 15060

SECTION 15090 - SUPPORTS & ANCHORS**PART 1 - GENERAL****DESCRIPTION**

The requirements of this section apply to the mechanical piping and equipment systems specified elsewhere in these specifications.

Provide pipe and equipment hangers, supports, anchors and related items for complete anchor, hanger and support systems.

QUALITY ASSURANCE

Standards: The Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry Practice SP-58 and SP-69 are referenced in this section.

Provide factory-fabricated horizontal piping hangers, clamps, hanger rod, shields, supports, etc., of the indicated MSS type and size.

Seismic Requirements: Provide seismic restraints in accordance with OSSC Section 1613. Design restraint systems in accordance with "Seismic Restraint Manual: Guidelines for Mechanical Systems," Second Edition, 1998, SMACNA, or "A Practical Guide to Seismic Restraint" ASHRAE RP-812, 1999.

SUBMITTALS

Submittals: In accordance with Section 01300.

Catalog Data: Submit construction details, and performance characteristics for each type and size of anchor, hanger, and support.

PART 2 - PRODUCTS**ACCEPTABLE MANUFACTURERS**

Manufacturers: B-Line, Carpenter & Paterson, Grinnell, Michigan, Superstrut or accepted substitute.

Listed Types: MSS Piping Types listed with Grinnell figure numbers in parentheses where applicable (or other manufacturers as noted).

SUPPORTS

Horizontal Piping Hangers and Supports:

Adjustable Clevis Hanger: MSS Type 1 (Fig. 260).

Adjustable Band Hanger: MSS Type 7 (Fig. 97), fabricated from steel.

Adjustable Swivel-Band Hanger: MSS Type 10 (Fig. 70).

Clamp: MSS Type 4 (Fig. 212, 216).

Double-Bolt Clamp: MSS Type 3 (Fig. 295A, 295H), including pipe spacers.

Equipment and Piping Supports:

Channel Support System: Galvanized, 12 gauge channel and bracket support systems, single or double channel as indicated on the Drawings or as required by piping and equipment weights. Grinnell "Power Strut" channel. Acceptable manufacturers: Super Strut, Globestrut, Bee, Kindorf or Unistrut.

Steel Brackets: Welded structural steel shapes complying with one of the following:

Light Duty: MSS Type 31 (Fig. 194).

Medium Duty: MSS Type 32 (Fig. 195).

Heavy Duty: MSS Type 33 (Fig. 199).

Rooftop Pipe Stands: MIRO Industries model 24-R or accepted substitute.

Vertical Pipe Clamps:

Two-Bolt Riser Clamp: MSS Type 8 (Fig. 261).

Four-Bolt Riser Clamp: MSS Type 42 include pipe spacers at inner bolt-holes.

Hanger Rod Attachment:

Hanger Rod: Grinnell Fig. 140 or 146 for all sizes. Right hand threaded.

Turnbuckles: MSS Type 13 (Fig. 230).

Weldless Eye-Nut: MSS Type 17 (Fig. 290).

Malleable Eye-Socket: MSS Type 16 (Fig. 110R).

Clevises: MSS Type 14 (Fig. 299).

Building Attachments:

Concrete Inserts: MSS Type 18 (Fig. 282), steel or Grinnell Power-Strut PS349 continuous channel. Acceptable Manufacturers: Michigan Hanger, Globestrut, Unistrut, Super Strut.

Clamps: MSS Type 19 (Fig. 285, 281), Type 20, 21 (Fig. 225, 226, 131), Type 23 (Fig. 86, 87, 88), Type 25 (Fig. 227), Type 27 through 30 where applicable.

Saddles and Shields:

Protection Saddles: MSS Type 39 (Fig. 160).

Protection Shields: MSS Type 40 (Fig. 167).

Preinsulated Pipe Supports: Pipe Shields Inc. or accepted substitute.

Pipe supported on rods - Models A1000, A2000, A3000, A4000 and A9000.

Pipe supported on flat surfaces - Models A1000, A2000, A5000, A6000 and A7000.

Pipe supported on pipe rolls - Models A3000, A4000, A5000, A6000 and A8000.

Miscellaneous Hanger Materials:

Metal Framing: Provide products complying with NEMA STD ML 1.

Steel Plates, Shapes and Bars: ASTM A-36.

Cement Grout: Portland cement (ASTM C-150, Type I or Type III) and clean uniformly graded, natural sand (ASTM C-404, Size No. 2). Mix at a ratio of 1.0 part cement to 3.0 parts sand, by volume with only the minimum amount of water required for placement and hydration.

Heavy Duty Steel Trapezes: Fabricate from steel shapes selected for the loads required; weld steel in accordance with AWS Standards.

Pipe Guides: Provide factory-fabricated guides, of cast semi-steel or heavy fabricated steel, consisting of a bolted two-section outer cylinder and base with a two-section guiding spider bolted tight to the pipe. Size guide and spiders to clear pipe and insulation (if any), and cylinder. Provide guides of the length recommended by the manufacturer to allow indicated travel.

Standard Bolts and Nuts: ASTM A 307, Grade A.

Concrete Anchors: Rawl Lok/Bolt, Hilti "HSL," ITT Phillips, Red Head Wedge Anchors, Ramset Trubolt or Dynabolt or accepted substitute.

Shop Primer: Manufacturer's standard rust inhibitive primer.

PART 3 - EXECUTION

3.01 INSTALLATION

General: Proceed with the installation of hangers, supports and anchors only after the required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including (but not limited to) the proper placement of inserts, anchors and other building structural attachments.

Install hangers, supports, clamps, and attachments to support piping and equipment properly from the building structure. Use no wire or perforated metal to support piping, and no supports from other piping or equipment. For exposed continuous pipe runs, install hangers and supports of the same type and style as installed for adjacent similar piping.

Prevent electrolysis in the support of copper tubing by the use of Strut Cushion or 2 layers of 10 mil tap at supports.

Arrange supports to prevent eccentric loading of joists and joist girders. Locate supports at panel points only.

Provisions for Movement:

Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate the action of expansion joints, expansion loops, expansion bends and similar units.

Install hangers and supports so that equipment and piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

Install hangers and supports to provide the indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 are not exceeded. Comply with the following installation requirements:

Clamps: Attach clamps, including spacers (if any), to piping outside the insulated piping support. Do not exceed pipe stresses allowed by ANSI B31.

Insulated Pipe Supports: Insulated pipe supports shall be supplied and installed on all insulated pipe and tubing.

Load Rating: All insulated pipe supports shall be load rated by the manufacturer based upon testing and analysis in conformance with ASME B31.1, MSS SP-58, MSS SP-69 and MSS SP-89.

Support Type: Manufacturer's recommendations, hanger style and load shall determine support type.

Insulated Piping Supports: Where insulated piping with continuous vapor barrier or where exposed to view in finished areas is specified, install hard maple wood insulation shields (Elcen Fig. 216) or steel pipe covering protection shields (MSS type 39) at each hanger.

Pipe Support:

Vertical Spacing: Support at base, at equivalent of every floor height (maximum 10' as required by Code) and just below roof line.

Screwed or Welded Steel or Copper Piping: Maximum hanger spacing shall be as follows:

	<u>Steel</u>	<u>Copper</u>
1-1/4" and smaller	7' span	6' span
1-1/2" pipe	9' span	6' span
2" pipe	10' span	10' span
2-1/2" & larger	12' span	10' span

Additional Support: Provide at each horizontal branch and/or at concentrated loads to maintain alignment and prevent sagging.

Install additional hangers or supports at concentrated loads such as pumps, valves, etc. to maintain alignment and prevent sagging.

Support Rod: Hanger support rods sized as follows:

<u>Pipe and Tube Size</u>		<u>Rod Size</u>	
<u>Inches</u>	<u>mm</u>	<u>Inches</u>	<u>mm</u>
1/2" to 4"	12.7 to 101.6	3/8"	9.5
5" to 8"	127.0 to 203.2	1/2"	12.7
10" to 12"	254.0 to 304.8	5/8"	15.9

Adjust hangers and supports to bring piping to proper levels and elevations.

Provide all necessary structural attachments such as anchors, beam clamps, hanger flanges and brackets in accordance with MSS SP-69. Attachments to beams wherever possible. Supports suspended from other piping, equipment, metal decking, etc., are not acceptable.

Horizontal banks of piping may be supported on common steel channel member spaced not more than the shortest allowable span required on the individual pipe. Maintain piping at its relative lateral position using clamps or clips. Allow lines subject to thermal expansion to roll axially or slide. Size channel struts for piping weights.

INSTALLATION OF ANCHORS

Install anchors at the proper locations to prevent stresses from exceeding those permitted by ANSI B31, where recommended in SMACNA "Seismic Restraint Manual" or exceeding manufacturer's recommended loading, and to prevent the transfer of loading and stresses to connected equipment.

Fabricate and install anchor by welding steel shapes, plates and bars to the piping and/or equipment and to the structure. Comply with ANSI B31 and AWS standards and SMACNA "Seismic Restraint Manual."

Bolting: Provide standard plate washers under heads and nuts of bolts bearing on wood. Soap threads of lag bolts prior to installing.

Structural Blocking: Locate as indicated and as required to support mechanical piping and equipment.

Where expansion compensators are indicated, install anchors in accordance with the expansion unit manufacturer's written instructions, to limit movement of piping and forces to the maximums recommended by the manufacturer of each unit.

Anchor Spacings: Install anchors at the ends of principal pipe runs, at intermediate points in pipe runs between expansion loops and bends. Make provisions for presetting of anchors as required to accommodate both expansion and contraction of piping.

Painting: Refer to Section 15050.

END OF SECTION 15090

SECTION 15250 - MECHANICAL INSULATION

PART 1 - GENERAL

DESCRIPTION

The requirements of this section apply to the insulation of mechanical equipment specified elsewhere in these specifications.

QUALITY ASSURANCE

Insulation Thickness and Thermal Performance: Comply with Chapter 13 provisions of the State of Oregon Structural Specialty Code.

Composite (Insulation, Jacket or Facing and Adhesives) Fire and Smoke Hazard Ratings: Not to exceed a flame spread of 25 or smoke development of 50 and containing less than 0.1% by weight deca-PDE fire retardant.

Component Ratings of Accessories (Adhesives, Mastics, Cements, Tapes, Finishing Cloth for Fittings): Same as "B" requirements above and permanently treated. No water soluble treatments.

PRODUCT DELIVERY, STORAGE AND HANDLING

General: In addition to the requirements specified in Section 15050, the following apply:

Deliver insulation, coverings, cements, adhesives and coatings to the site in factory-fabricated containers with the manufacturer's stamp or label affixed showing fire hazard ratings of the products. Store insulation in original wrappings and protect from weather and construction traffic.

Protect insulation against dirt, water, chemical and mechanical damage. Do not install damaged insulation. Remove such insulation from project site.

SUBMITTALS

Submit catalog data and performance characteristics for each product specified.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

Insulating Manufacturers: Schuller, Knauf, Armstrong, Owens-Corning, Pittsburgh Corning, Pabco, Imcoa or Certain Teed. Schuller products are listed unless indicated otherwise.

Adhesive Manufacturers: Benjamin Foster, 3M, Insul-Coustic, Borden, Kingco or Armstrong.

PIPING INSULATION

Exterior Installations: Same as for interior installations except 0.016" aluminum finish jacket.

Pipe Temperatures Minus 30 to 180 Deg. F: Flexible, preformed, pre-slit, self-sealing elastomeric pipe insulation up to 2-1/8" ID, thermal conductivity of 0.20 - 0.26 BTU/hr. sq. ft./in. at 50 deg. F and vapor transmission rating of 0.2 perms/inch. Apply in thickness necessary to prevent condensation on the surface at 85 deg. F and 70% RH and comply with Oregon Energy Code. Armstrong "Armaflex 2000" or, in concealed locations, Imcoa or Nomaco also approved. Provide aluminum shield on exterior installations.

DUCT INSULATION

Interior Above Grade Ductwork: Glass fiber blanket with "FSK" facing containing less than 0.1% by weight deca-PDE fire retardant, k-value = 0.31 at 75 deg. F, and UL 25/50 surface burning rating. Johns Manville "Microlite".

INSULATION ACCESSORIES

Insulation Compounds and Materials: Provide rivets, bands, adhesives, cements, coatings, sealers, welded studs, etc., as recommended by the manufacturers for the insulation and conditions specified.

Jacket Lap Sealing Adhesives: Foster Drion 85-75 contact cement or approved substitute.

PART 3 - EXECUTION

PIPING INSULATION

General: Do not insulate underground piping except at joints and fittings on preinsulated piping unless indicated otherwise.

Refrigerant Piping: 0.5" on 1" or smaller.

Pipe Fittings: Insulate and finish all fittings including valve bodies, bonnets, unions, flanges and expansion joints with precut fiberglass insulation and preformed PVC covers sealed to adjacent insulation jacket for continuous vapor barrier covering over all fittings.

Piping Insulation Lap Seams and Butt Joints: Install insulation jacket in accordance with manufacturer's recommendation. Where jacket joint and lap seams have not adhered, remove affected section of insulation and reinstall or apply lap sealing adhesive in accordance with manufacturer's instructions.

DUCTWORK INSULATION

Ductwork: Insulate the following:

All supply ductwork.

All supply and return ductwork in systems routed in unconditioned spaces or exposed to the outside conditions.

All outside air intake ducts.

All ductwork required to be insulated by code.

Generator Exhaust Piping: Insulate piping and muffler from engine discharge to roof penetration. Do not insulate flex connections.

Insulation Thickness: Select board and blanket insulation of thickness required to provide the following installed R-value.

All heating and cooling system supply and return ducts located inside of building envelope, R-5.

All heating or cooling system supply and return ducts located on the exterior of the insulated building envelope and all outside air intake ducts, R-8.

Fittings: Wire and duct adhesive as required. To prevent sagging on all rectangular or square ducts over 24" wide, install Gramweld or equal welding pins on the bottom. Maximum spacing 18" on center in both directions.

Installation: Applied with butt joints, all seams sealed with vapor seal mastic or taped with 2" wide vapor-proof, pressure-sensitive tape. Seal all penetrations with vapor barrier adhesive.

Internally Lined Ductwork: Where internally lined ductwork is indicated on the Drawings and/or specified, no exterior insulation is required. Select duct lining to provide the required R-value. Carefully lap the ends of the exterior insulation a minimum of 6" past the interior insulation unless otherwise shown. Seal the end of vapor barrier jacket to the duct with mastic where the vapor barrier is required. Duct lining is specified in Section 15880.

END OF SECTION 15250

SECTION 15585 - REFRIGERANT PIPING SYSTEM**PART 1 - GENERAL****DESCRIPTION**

The requirements of this section apply to the refrigerant piping system connecting refrigeration and HVAC equipment specified in other sections of these specifications. Provide pipe, pipe fittings and related items required for complete piping system.

Related Work: The requirements of Section 15050, Common HVAC Materials and Methods, also apply to this section.

QUALITY ASSURANCE

General: ASTM, and ANSI Standards are indicated. In addition, special standards are referenced where neither ASTM nor ANSI Standards are applicable. Comply with federal and local regulations regarding the handling of refrigerant.

Labeling: All piping shall be continuously and legibly labeled on each length as required by codes and standards and including as a minimum, country of origin, manufacturer's identification marking, wall thickness designation, and applicable standards and approvals. Fittings shall be labeled as required by the referenced standard. Tubular fixture traps shall be stamped with manufacturer's mark and material thickness.

Air Conditioning and Refrigeration Equipment Rating: Rated in accordance with ARI certified rating procedures and bear the ARI label.

Installation Contractor: Manufacturer's authorized installation and start-up agency normally engaged and experienced in air conditioning/refrigeration work and certified in the handling of refrigerant.

SUBMITTALS

Submit catalog data, construction details, and performance characteristics for each type and size of refrigeration equipment.

Submit operating and maintenance data.

STORAGE AND HANDLING

Provide factory-applied end caps on each length of pipe and tube. Maintain end caps through shipping, storage and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube. Protect flanges and fittings from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

PART 2 - PRODUCTS**PIPING MATERIALS**

Copper Pipe and Tube:

Application: Refrigerant.

Pipe: ASTM B88. Type ACR hard temper copper with soldered joints. Cleaned and sealed at the factory.

Refrigerant Fittings: ANSI/ASME B31.5 or SAE J 513-F, "Refrigeration Tube Fittings." Where conflicts occur, B31.5 shall govern.

MISCELLANEOUS PIPING MATERIALS/PRODUCTS

Brazing Materials: Provide brazing filler rod and flux materials as determined by the installer to comply with installation requirements.

Gaskets for Flanged Joints: ANSI B16.21 with pressure and temperature rating required for the service indicated.

REFRIGERATION SPECIALTIES

General: Provide the following equipment where they are not a part of the factory installed equipment accessories. Select equipment for operation with the refrigerant being utilized and for the pressure and temperature conditions indicated. Sporlan, Alco, Henry, Detroit, or as listed for each equipment.

Thermostatic Expansion Valve: Capacity matched for the system, angle or straight through pattern external equalizer, brass body complete with capillary and remote sensing bulb.

Solenoid Valves: For installation in liquid, suction and/or hot gas circuit as indicated. Brass body, replaceable coil of voltage indicated.

Liquid and Moisture Indicators: Moisture and liquid indicator installed after the liquid line filter dryer.

Liquid Line Filter Dryer: Sealed container up to approximately 10 tons of capacity and replaceable desiccant dryer core and strainer on larger capacity systems.

Charging Valves: Quick coupling type connection with removable valve core.

Service Valves: Install liquid, suction and discharge line valves, all suitable for refrigerant used and location in the system, designed so as to be easily packed with pressure on the line and with wing caps that completely enclose valve stem. Install all purge valves, relief valves or other valves required for safe and proper operation of the system and as may be required by State or local codes. Detroit, Alco, Sporlan or Automatic Products approved substitute.

PART 3 - EXECUTION**PIPE INSTALLATION**

Air Conditioning Refrigeration Subcontractor: Submit 5 copies of piping diagram for approval. Install all refrigerant piping, major components and all minor components, such as dehydrator, service valves, etc., and arrange piping for hot gas bypass for low load operation. Test system, evacuate, charge, start-up and adjust. Refer to applicable sections of these Specifications for test, evacuation, etc.

Piping Runs: Route piping close to and parallel with walls, overhead construction, columns and other structural and permanent-enclosure elements of the building. If not otherwise indicated, run piping in the shortest route which does not obstruct usable space or block access for servicing the building or equipment and avoid diagonal runs. Wherever possible in finished and occupied spaces, conceal piping from view. Do not encase horizontal runs in solid partitions.

Refrigerant Piping:

Use Type "L" hard drawn copper tubing and make all changes in direction with specified fittings.

Lay out the refrigerant piping system in a manner to prevent liquid refrigerant from entering the compressor and so that oil will return to the compressor. Slope all horizontal suction lines toward the compressor. Take special care to keep all tubing clean and dry.

Install all refrigerant piping straight and free from kinks and restrictions, properly supported to minimize vibration. Provide hangers at 5' spacing for 1/2" lines, 6' spacing for 1" lines and 8' spacing for 1-1/2" and larger lines. Submit complete diagram for approval.

Comply with the refrigerant piping installation instructions of the refrigeration equipment manufacturer.

PIPING JOINTS

General: Provide joints of the type indicated in each piping system, and where piping and joint as manufactured form a system, utilize only that manufacturer's material.

Braze Copper Tube and Fitting Joints: Where indicated, in accordance with ANSI/ASME B31.5. Pass a slow stream of dry nitrogen gas through the tubing at all times while brazing to eliminate formation of copper oxide.

Flanged Joints: Match flanges within piping system and at connections with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gasket.

Changes in Direction: Use fittings for all changes in direction. Run lines parallel with building surfaces.

Unions and Flanges: At all equipment to permit dismantling and elsewhere as consistent with good installation practice.

Expansion: Provide loops, swing joints, anchors, runouts and spring pieces to prevent damage to piping or equipment.

MISCELLANEOUS PIPING EQUIPMENT

Floor, Wall and Ceiling Plates: Chrome-plated pressed steel or brass screw locked split plates on all pipe penetrations in finished spaces.

Filters: Install in a manner to permit access for removal and replacement of filter cartridge.

Sleeves: At all penetrations of concrete or masonry construction. PVC, 24 gauge galvanized steel or Schedule 40 galvanized steel pipe. Fabricate sleeves 1" diameter larger than pipe or insulation. PVC and sheet metal sleeves at non-structural penetrations only.

Sleeve Caulking: Grout insulated pipe with cement mortar or approved waterproof mastic. All caulking or grouting shall extend full depth of sleeve. Install UL sealing caulk, putty and/or system at all penetrations of fire rated walls, floors and ceiling.

CLEANING

General: Clean all dirt and construction dust and debris from all mechanical piping systems and leave in a new condition. Touch-up paint where necessary.

Refrigeration System Piping: If, for any reason, sanitized and sealed-at-the-mill tubing is not used, clean the tubing as follows:

Wipe each tube internally with a dry, lintless cloth followed with a clean lintless cloth saturated with recommended refrigerant.

Repeat until the saturated cloth is not discolored by dirt.

Wipe with a clean cloth saturated with compressor oil and squeezed dry.

Wipe with a dry, lintless cloth.

TEST

General:

Minimum duration of two hours or longer, as directed for all tests. Furnish report of test observation signed by qualified inspector. Make all tests before applying insulation, backfilling, or otherwise concealing piping or connecting fixtures or equipment. Where part of the system must be tested to avoid concealment before the entire system is complete, test that portion separately, same as for entire system.

Provide all necessary temporary equipment for testing, including pump and gauges. Remove control devices before testing and do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Fill each section with water and pressurize for the indicated pressure and time.

Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 5% of test pressure.

Repair: Repair piping system sections which fail the required piping test by disassembly and re-installation, using new materials to the extent required to overcome leakage. Do not use chemical stop-leak compounds, solder, mastics, or other temporary repair methods.

Refrigerant System:

When the refrigerant connections have been completed, close the compressor suction and discharge valves (or receiver outlet valve in the case of condensing unit) and test the balance of the system to near operating pressure with a dry nitrogen.

Carefully test all joints, using soap and water or other sudsing solution. After all joints are tested, discharge the gas and repair all leaks, then repeat the test with a mixture of nitrogen and R-410A and a halide torch or an electronic leak detector.

Evacuate the system to remove moisture and non-condensables. Lower the absolute pressure with a vacuum pump to 1000 microns of mercury. Apply external heat as required to vaporize moisture.

Dehydrate each refrigerant circuit by satisfactory use of a vacuum pump before charging with refrigerant. Furnish all necessary refrigerant and oil for complete operating charge of the system. Upon completion of the work of construction, test all refrigeration equipment under normal operating conditions and leave in operating order. Adjust automatic temperature controls.

After the first 24 hours of operation, measure the pressure drop across the suction filter. If the pressure drop exceeds 5 pounds per square inch, replace the cartridge with a new one, retesting and replacing the cartridge and/or adjusting the system as necessary to achieve a pressure drop of less than 5 pounds per square inch in 24 hours.

END OF SECTION 15585

SECTION 15850 - AIR HANDLING**PART 1 - GENERAL****DESCRIPTION**

Furnish and install Air Handling and Heating Equipment as specified herein and shown on the Drawings.

Equipment capacity and size as indicated in the equipment lists on the Drawings.

QUALITY ASSURANCE

Air Handling Equipment: Rated in accordance with AMCA certified rating procedures and AMCA labeled.

Air Conditioning and Refrigeration Equipment Rating: Rated in accordance with ARI certified rating procedures and AMCA labeled.

Codes: Comply with applicable sections of the State Mechanical Specialty Code and Mechanical Fire and Life Safety Code.

PART 2 - PRODUCTS**EXHAUST FANS**

Cabinet Exhaust Fans: Direct drive, forward curved centrifugal wheel, sleeve bearings, motor and wheel isolated from unit on vibration isolators; provide duct connections with backdraft dampers on discharge. Size and capacity as indicated on Drawings. Provide with speed control where noted on schedule. Penn, Jenn-Air, Greenheck, Carnes, Cook, or approved.

ELECTRIC FURNACE

Unit shall be ARI certified and UL labeled. Carrier, Trane, Lennox, York, or approved.

Electric back-up heat section shall be provided in 2 sections for staged operation.

Furnace casing of enameled steel with duct connections, access panels, and internal thermal insulation in heat exchanger section and acoustic lining in fan section.

Provide with fan switch, high limit switch, fan door safety switch, and control transformer. Provide unit with external filter rack for 2" thick disposable filters. Provide cooling coil condensate drain routed to approved point of disposal.

Programmable Thermostat with Economizer Logic Controller:

Provide with electronic, 7-day programmable thermostat and controller system for night-set-back, economizer and heating/cooling control sequences. Honeywell 8220 Series or approved substitute.

Economizer Logic Controller: Provide solid state economizer logic module to proportion outdoor and return air dampers to control for "free" cooling. Unit to include inputs for discharge temperature, dry bulb temperature input, and mixed or return air input. Unit shall be California Title 24 compliant and be suitable for operation of split system heat pump with gas fired furnace. Belimo Zip or approved.

DX Coil:

Evaporator coil(s) shall be copper tube with aluminum fins mechanically bonded to the tubes.

Aluminum micro channel tube and Fin is approved.

Evaporator coils to have galvanized steel end casings.

Evaporator coils to have equalizing type vertical tube distributors with a top suction connection.

Coil sizing shall match outdoor unit.

AIR COOLED CONDENSING UNIT / HEAT PUMP UNIT

Factory-assembled unit incorporating hermetic compressor, condenser coil, condenser fan, refrigerant piping, controls, and power wiring enclosed in a weather-resistant cabinet needing only refrigerant and power and control wiring to be operative. Capacity as shown on Drawings.

Compressor shall be scroll-type mounted on vibration isolators. Provide with crankcase heater, short cycle protection, and acoustic cover. Provide with reversing valve for heat pump operation.

Condenser section to include copper tube, aluminum fin condensing coil, dynamically balance fan driven by totally enclosed fan motor with permanently lubricated bearings.

Refrigerant system to include suction and liquid service valves, test gauge connections, high and low pressure cutouts, filter dryer. Include valve for reverse operation (heat pump operation).

Unit shall include internal fuses, starting controls, and internal wiring complying with National Electrical Code and UL listed, for a single field power connection. Disconnect by Division 26.

Include low ambient controller for operation at 40 degrees outside air with low pressure switch bypass. Provide controller to modulate capacity based on suction pressure, head pressures and system demand.

Approved Manufacturers: Carrier, Trane, York, Lennox, or Daikin.

PART 3 - EXECUTION

INSTALLATION

Install and arrange equipment as shown on the Drawings and as recommended by the equipment manufacturer.

AIR CONDITIONING REFRIGERATION SUBCONTRACTOR

Complete air conditioning refrigeration system shall be installed by a subcontractor normally engaged in air conditioning work who is an authorized installation and service agent for the manufacturer of the primary equipment. Include all necessary refrigerant piping, major components and all minor components, such as dehydrator, service valves, etc. Submit 5 copies of piping diagram for approval. System test, evacuation, charging, startup and adjustment by refrigeration subcontractor. Refer to applicable sections of these specifications for test, evacuation, etc.

AIR HANDLING INSTALLATION

Installation and Arrangement: Air handling equipment shall be installed and arranged as shown on the Drawings. Comply with the manufacturer's recommendations for installation connection and start-up.

Lubrication: All moving and rotating parts shall be lubricated in accordance with the manufacturer's recommendations prior to start-up.

Filters: Specified filters or approved temporary construction filters shall be installed in supply units prior to start-up or when used for drying and/or temporary heat.

END OF SECTION 15850

SECTION 15880 - AIR DISTRIBUTION**PART 1 - GENERAL****DESCRIPTION**

Provide Air Distribution Equipment as specified herein and as shown on the Drawings.

Equipment capacity and size shall be as indicated on the Drawings.

QUALITY ASSURANCE

Air Handling Equipment Rating: In accordance with AMCA certified rating procedures and bearing the AMCA label.

Ductwork: Comply with requirements of Chapter 6 of the Oregon State Mechanical Specialty Code.

Field Wiring: Comply with requirements of Section 15050.

PART 2 - PRODUCTS**SHEET METAL**

Quality Assurance: Galvanized steel sheet metal except where otherwise indicated. Metal gauges, joints and reinforcement in accordance with Mechanical Code, ASHRAE and SMACNA tables and recommendations.

Acoustical Duct Lining: Line ducts with 1" thick, Schuller "Linacoustic," Gustin Bacon "Ultra-Liner," or Owens Corning "Aeroflex" meeting NFPA 90A requirements for maximum flame spread and smoke developed. Mechanically attach lining to sheet metal duct with Schuller Grip Nails or Gramweld welding pins. Apply fire-retardant type adhesive similar to Schuller No. 44 adhesive, Benjamin Foster 81-99, Insul-Coustic 22 or 3M equivalent on all leading edges, joints and seams.

Duct Sealing Tapes: Provide one of the following UL listed ductwork sealing tape systems.

Aluminum bonded to aluminized mylar reinforced with fiberglass mesh backing an elastomeric pressure sensitive adhesive specifically formulated for adhesion to galvanized metal. Hardcast AFG-1402 or accepted substitute.

Two-part sealing system with woven fiber, mineral gypsum impregnated tape and non-flammable adhesive. Hardcast "DT" tape and "FTA-20" adhesive, United "Uni-Cast" system, or accepted substitute.

For joints and seams exposed to the weather in lieu of soldering, United "Uni-Cast" system or approved.

Duct Joints for Sheet Metal Ducts: "Ductmate System" by Ductmate Industries, Inc., for making transverse rectangular and round duct joints at contractor's option. Ward Duct Connectors, Inc., Lockformer TDC, Mez Industries, or acceptable substitute.

Flexible Ductwork-Low Pressure: Insulated low pressure flexible duct, factory fabricated assembly consisting of a zinc-coated spring steel helix seamless inner liner, wrapped with a nominal 1" thick, 1 pound/cubic foot density fiberglass insulation. The assembly shall be sheathed in a vapor barrier jacket, factory vapor resistance sealed at both ends of each section. The composite assembly, including insulation and vapor barrier, shall meet the Class 1 requirements of NFPA Bulletin No. 90-A and be labeled by Underwriters Laboratories, Inc., with a flame spread rating of 25 or less and a smoke developed rating of 50 or under. The duct shall have factory sealed double air seal (interior and exterior) to assure an airtight installation. Genflex, ATCO, Wiremold, Thermaflex, Glassflex, Clevepak, Schuller, or accepted substitute.

ACCESSORIES

Manual Volume Dampers: Construct of material two gauges heavier than duct in which installed; single plate up to 12" wide; multiple over 12" wide. Hem both edges 1/2" and flange sides 1/2". Use Young, Duro-Dyne or accepted substitute damper accessories. Young numbers are shown.

No. 605 bearing set with No. 403 regulator for dampers up to 24" long.

For dampers over 24" long use No. 660 3/8" rod, No. 656 end bearing and No. 403 regulator.

Where damper regulators are not readily accessible, use No. 660 or No. 661 rod extensions and No. 301 and No. 315 concealed damper regulators as required.

Location of all volume dampers is not necessarily shown on Drawings; minimum required is one in each supply, return or exhaust main and one in each branch.

Outside Air Intake/Exhaust Head: Aluminum cap with curb connection, flashing, 1/2" mesh galvanized bird screen and hinged access. Greenheck, Cook Carnes, Penn or accepted substitute.

Locking Connection Straps: 1/2" wide positive locking steel straps or nylon self-locking straps. Panduit or accepted substitute.

Access Doors In Sheet Metal Work:

Hollow core double construction of same or heavier gauge material as duct in which installed. Use no door smaller than 12" by 12" for simple manual access or smaller than 18" by 24" where personnel must pass through infrequently. Use 24" by 60" minimum for filters and more frequent maintenance. Use Ventlok or accepted substitute hinges and latches on all doors.

100 series hinges and latches on low pressure system doors up to 18" maximum dimension.

200 series on larger low pressure system doors and 333 series on high pressure systems.

Construct doors up to 18" maximum dimension with 1" overlap, furr and gasket with 3/4" by 1/8" sponge rubber. Fit larger doors against 1-1/2" by 1/8" or angle frame and gasket with 3/4" by 1/8" sponge rubber or felt.

Opposed Blade Volume Damper: Install opposed blade volume damper in each zone supply duct on discharge of multi-zone units and where indicated on Drawings. Young No. 817 or accepted substitute.

Flexible Connections: Neoprene impregnated fiberglass connection. Ventglass, Duro-Dyne, or accepted substitute.

Control Dampers: Construct of aluminum frame and aluminum airfoil blades with axle shafts and/or operating "jackshafts" with interconnecting blade linkages in the side channels of the frame to provide coordinate tracking of all blades. Interlocking multi-blade type, except where either dimension is less than 6", a single blade may be used. Opposed blade type on all modulating dampers and parallel blades on all two position dampers. Provide with stainless steel, silicone, or vinyl jamb seal and vinyl or silicone blade seals. Damper assembly rated for maximum air leakage of 3 CFM per square foot at 1" wg pressure or less and with interconnecting blade linkages in the side channels of the frame. Performance rating for the damper shall be tested under the AMCA Certified Ratings Program. Greenheck VCD-40, Ruskin CD 50 or TAMCO Series 1000.

Gravity Exhaust Head Outside Air Intake:

Rectangular aluminum cap with factory curb and counter flashing curb connection 1/2" mesh galvanized bird screen. Greenheck, Exitaire, Carnes, Acme, Powerline, Penn or accepted substitute.

Install with relief damper in curbs for reliefs.

Exterior Wall Louvers: Prefabricated extruded 6063-T5 aluminum rain resistant blades with frame to suit building construction. 1/2", 16 gauge aluminum wire mesh on back side of all intake louvers and insect screen on exhaust/relief louvers. 4" deep, 0.081" thick, fixed vertical type blade at approximately 1.5" on-center, AMCA 500 tested for 1200 fpm without water penetration, and maximum of 0.11" wg intake pressure loss and 0.11" wg exhaust pressure loss at 700 fpm. Provide Kynar finish. Color per Architect selected from standard colors. Greenheck, EVH-401 as basic pattern on blade and frame, Ruskin, Cesco, American Warming, or approved.

GRILLES, REGISTERS AND DIFFUSERS

Description: Provide grilles, registers and diffusers as shown on the Drawings.

Finishes:

Steel: Flat white enamel prime coat, factory applied on ceiling diffusers. Others are to have a baked enamel finish, color as selected by Architect.

Aluminum: Anodized clear finish unless indicated otherwise.

Manufacturers: Carnes, Krueger, Titus, Price, and Tuttle & Bailey are accepted substitutes where only Titus model numbers are listed. Where other manufacturer's products are listed and/or "accepted substitute" is indicated, only the products or an accepted substitute for that item shall be provided.

Perforated Face Diffusers: Perforated snap-in or concealed hinged face plate with internal deflection blades at diffuser neck in steel or extruded aluminum frame and margin to suit the ceiling construction. Provide with opposed blade volume damper. Panel size shall be 24" x 24" where lift-out tile ceiling system is indicated. Titus PCS.

Ceiling Matched Return and/or Exhaust Register: To match adjacent ceiling outlets. Use in spaces containing ceiling diffusers and/or T-bar ceilings. Provide with damper except where dampered plenums are indicated. Match manufacturer of supply.

Sidewall Supply Grille or Register: Double deflection grille with face bars parallel to long dimension on ceiling type and horizontal on wall type; bars to be individually adjustable, spaced on 0.66" to 0.75" centers; key operated opposed blade volume damper. Titus 300RL.

Sidewall or Ceiling Return or Exhaust Register: Face bars parallel to long dimension on ceiling type and horizontal on wall type; bars set at 35 degrees to 45 degrees, spaced on 0.66" to 0.75" centers; key operated opposed blade volume damper. Titus 350RL series.

PART 3 - EXECUTION

EQUIPMENT INSTALLATION

Air Handling Equipment Installation and Arrangement: Install and arrange as shown on Drawings. Comply with the manufacturer's recommendations for installation, connection, and start-up.

Equipment Access Panels: Locate free of all obstructions such as ceiling bars, electrical conduit, lights, ductwork, etc.

Filters: Install specified filters or accepted substitute temporary construction filters in supply units and systems prior to start-up or use for drying and/or temporary heat. Replace prior to acceptance of project.

INSTALLATION OF GRILLES, REGISTERS AND DIFFUSERS

Size and air handling characteristics shall be as shown on the Drawings.

Locate, arrange, and install grilles, registers and diffusers as shown on the Drawings. Locate registers in tee-bar ceilings with diffusers centered on the tile unless indicated otherwise.

DUCTWORK INSTALLATION

Support: Install ductwork with 1" wide 16 gauge cradle hangers not more than 8' on centers or as required by code. Support terminal units independent of adjacent ductwork. Attach to available building construction according to good practices for materials involved.

Fan and Air Handling Unit Flexible Connections: Install neoprene impregnated fiberglass connections in ductwork at all rotating equipment. Ventglass, Duro-Dyne or accepted substitute.

Elbows and Fittings: Construct elbows with throat radius equal to duct width in plane of turn or make them square and provide double wall, air foil turning vanes. Round ducts 14" or smaller may be four-section adjustable type. Gauge to be at least 26.

Fittings: Make transitions and take-offs as shown on Drawings. Provide volume dampers and splitter dampers as indicated on Drawings and as specified.

Acoustical Duct Lining: Acoustically line all outside air ducts and plenums, all fan unit intake and discharge plenums, all ductwork indicated as lined on the Drawings, all sheet metal ductwork specified per Section 15250 as insulated, where exposed to view or subject to damage in areas such as mechanical rooms, and, at the Contractor's option, all insulated ductwork specified in Section 15250.

Manual Volume Dampers: Location of all volume dampers are not necessarily shown on the Drawings. Provide a minimum of one volume damper in each supply, return or exhaust branch. Install dampers in fiberglass ductwork (where fiberglass ductwork is allowed) with galvanized sheet metal sleeves of sheet metal gauges required for metal duct systems of the same dimensions.

Duct Insulation: Insulate all ductwork specified in Section 15250 as requiring insulation. In addition, all ductwork indicated in Table No. 53F of the Structural Specialty Code and Fire and Life Safety Regulations shall be insulated or lined.

Sleeves: Provide galvanized sheet metal plaster ring around ductwork penetrating exposed finished walls.

Plenums: Construct sheet metal plenums and partitions of not lighter than 18 gauge galvanized steel and reinforce with 1-1/2" by 1/2" by 1/8" angles as required to prevent drumming or breathing.

Access: Install necessary access opening and covers for cleaning, wiring or servicing motors, filters, fans, both entering and leaving air sides of coils, fire and/or smoke dampers and to other equipment located within or blocked by sheet metal work.

Sealing: Caulk, seal, grout and/or tape ductwork and plenums to make airtight at seams, joints, edges, corners and at penetrations. Solder all seams, joints, etc., on all ductwork exposed to the weather. Install specified tape in accordance with manufacturer's requirements using degreaser on surfaces to be taped and wiped to eliminate moisture.

Flexible Duct Connections:

Install in full extended condition, free of sags and kinks, using only the minimum length required to make the connection.

Make all joints and connections with 1/2" wide positive locking steel straps or nylon self-locking straps and make connections to non-metallic ducts with sheet metal sleeves or manufactured sheet metal "spin-in" fittings.

Thoroughly coat all high pressure duct interior with an approved high pressure duct sealer to overlap 3" and secure in place over sheet metal collar with 1/2" wide positive locking strap. On vertically suspended ducts, secure with a minimum of three sheet metal screws on a maximum of 8" on center.

NEW DUCTWORK CLEANING

Store all ductwork materials on pallets or above grade, protected from weather, dirt/mud and other construction dust.

Remove all accumulated dust, dirt, etc. from each duct section as it is being installed.

Clean all diffusers, grilles and registers just prior to project final completion.

END OF SECTION 15880

SECTION 15990 - TESTING, ADJUSTING & BALANCING

PART 1 - GENERAL

DESCRIPTION

Work Included: After completion of the work of installation, test and regulate all components of the new heating, air conditioning and ventilating systems to verify air volumes and heating-cooling flow rates indicated on the Drawings.

Balancing Organization:

Balancing of the Heating and Air Conditioning Systems: Performed by a firm established in the State of Oregon providing this service.

Balancing Organization: Approval by Architect. Air Balancing Specialties, Air Introduction & Regulation, Pacific Coast Air Balancing, Southwest Air Balancing, Precisionaire Northwest, Air Test & Balance, SAS, Accurate Balancing Agency or approved.

Provide all necessary personnel, equipment, and services.

SUBMITTALS

Balancing Data: Include the following minimum information in the Operation and Maintenance Data, as specified in Section 15050.

Names or initials of personnel performing the balancing.

Dates balancing was performed.

List of balancing instruments utilized.

Weather conditions at the time of the test.

Mechanical system descriptions.

All motor rated voltages, amps, starter and overload protective device sizes.

All motor operating data.

Fan cfm, rpm, operating static pressures, driven and motor sheave data, and all drive changes necessitated to obtain design capacities. List actual minimum outside air volumes measured for each system.

All supply, return and exhaust air outlet cfm readings.

DETAILED REQUIREMENTS

Adjusting and Balancing:

Adjust and balance all portions of the mechanical systems to produce indicated results within limits of minus 5 or plus 10 percent or as subsequently directed by the Architect.

Balancing data may be spot checked with instruments similar to that used by the balancing firm.

If, in the judgment of the Architect, the discrepancies warrant additional adjustment, readjust and rebalance the systems at no additional project cost.

END OF SECTION 15990

SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS**PART 1 - GENERAL****DESCRIPTION**

The provisions of the General Requirements, Supplementary Requirements, and Division 1 apply to the electrical work specified in this Section.

The requirements of this Section apply to the electrical systems specified in these Specifications and in other Division 16 sections.

Provide all items, articles, materials, equipment, operations and/or methods listed, mentioned, shown and/or scheduled on the Drawings and/or in these Specifications, including all labor, supervision, services, permits, fees, and incidentals necessary and required to provide a complete and operable facility with complete systems as shown, specified, and required by applicable codes.

The work shall include, but not be limited to, the following systems:

- Electrical service retrofit complete per serving utility company requirements.
- Electric service and distribution equipment.
- Complete power systems, including branch circuits, devices, etc.
- Connection of electrical equipment furnished under other Divisions of this Specification.
- Wiring to and connection of electrical equipment or appliances furnished outside of these Specifications and Contract but described on the Electrical Drawings.
- Special systems as specified herein.
- Grounding.

Advise subcontractor, suppliers, and vendors involved in the work specified in this Section of the applicable requirements.

Temporary electrical service, Division 1.

QUALITY ASSURANCE

All work and materials shall conform to all applicable local and state codes and all federal, state and other applicable laws and regulations. All clarifications and modifications which have been cleared with appropriate authorities are listed under the applicable sections. All electrical products shall bear the UL label.

Whenever the requirements of the Specifications or Drawings exceed those of the applicable code or standard, the requirements of the Specifications and Drawings shall govern.

Codes and Standards: Comply with the provisions of the following referenced codes, standards and specifications:

- Institute of Electrical and Electronic Engineers (IEEE)
- Federal Specifications (FS)
- American National Standards Institute (ANSI)
- National Electrical Manufacturer's Association (NEMA)
- National Fire Protection Association (NFPA)
- Underwriters Laboratories, Inc. (UL)

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Factory Mutual (FM)

Uniform Building Code (UBC) with State and Local Amendments

National Electrical Code (NEC) with State and Local Amendments

American Society for Testing and Materials (ASTM)

Americans with Disabilities Act (ADA)

Uniform Fire Code (UFC) with State and Local Amendments

National Electrical Contractors Association (NECA)

Each piece of equipment furnished shall meet all detailed requirements of the Drawings and Specifications and shall be suitable for the installation shown. Equipment not meeting all requirements will not be acceptable, even though specified by name. Where two or more units of the same class of equipment are furnished, use product of the same manufacturer; component parts of the entire system need not be products of same manufacturer. Furnish all materials and equipment, new and free from defect and of size, make, type and quality herein specified or approved by the Architect. All materials shall be installed in a neat and professional manner.

All apparatus shall be built and installed to deliver its full rated capacity at the efficiency for which it was designed.

All disconnect switches, panelboards, and equipment of like nature shall be of the same manufacturer.

The Drawings and Specifications are complementary. What is called for by one shall be as though called for by both.

WORK OF OTHER CONTRACTS

Work under this contract shall be conducted in a manner to allow for the future installations of such equipment or items, and include the wiring and/or devices shown on the Drawings or listed in other sections of this Specification. Also see "Equipment Connections."

WORK OF OTHER DIVISIONS

Work under this Division shall be conducted in a manner to cooperate with the installation of such equipment or items as specified in other Divisions.

Control devices and control wiring relating to the heating and air conditioning systems are specified under other Sections of these Specifications except for provisions or items specifically noted on the Drawings or specified herein.

Consult all Drawings and Specifications in this project and become familiar with all equipment to be installed. Coordinate all aspects of the construction with the other trades on the job to ensure that all work and materials required to provide a complete and operational facility are included in the bid.

All sections of Division 16 are interrelated and shall be considered in their entirety when interpreting any material, method, or direction listed in any section of Division 16. Individual sections are not written for specific subcontractors or suppliers but for the general contractor.

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

Submit in accordance with Division 1 full technical and descriptive shop drawing data on proposed materials and equipment as detailed in each section.

The Contractor shall verify that all equipment submitted can be delivered and installed within the time constraints of the construction period.

Include the manufacturer, type, style, catalog number, complete specification, certified dimensions, and description of physical appearance for each item and option submitted. Reproduction of catalog data sheets shall be clean and legible to show all details, including gauge of metal used.

Include only information on exact equipment to be installed, not general catalogs of the manufacturer. Where sheets show proposed equipment as well as other equipment, identify proposed equipment with rubber stamp arrow or similar concise method.

Submit with each copy a transmittal letter verifying that all included equipment submittals have been carefully considered for quality, dimensions, function, and have been coordinated with the Drawings and Specifications. Guarantee that proposed materials will meet or exceed the quality and function of those specified.

Include wire run and connection diagrams for all signal and/or low voltage systems, including floor plans.

Submittal Review: The submittal review process is a means to determine quality control. The action noted to be taken (or where conflicts with the contract documents are not noted) shall not be interpreted by the Contractor as automatic "change orders." Approval of the data for substitution and shop drawings shall not eliminate the contractor's responsibility for compliance with Drawings or Specifications, nor shall it eliminate the responsibility for freedom from errors of any sort in the data discovered prior to or after the review process. Deviations, discrepancies, and conflicts between the submittals and the Contract Documents shall be called to the Architect's attention in writing at the time of transmittal of the data.

Unless otherwise directed by Division 1, submittal data shall be in a 3-ring plastic binder with a clear plastic sleeve and a project identification sheet inserted. Arrange submittals numerically with specification sections identified on divider tabs. All required sections shall be submitted at one time.

PRODUCT SUBSTITUTION

Material other than those specified may be approved for this project providing a written request is submitted to the Architect prior to bid in accordance with Instructions to Bidders. Requests shall include complete specifications, dimensions, manufacturer and catalog number for each item for which approval is desired. If, in the opinion of the Architect, the material is not complete or if it is not an acceptable substitute, he may reject it. The Architect's evaluation will be based solely on the material submitted.

Manufacturer's (by name only, not specific items) will be reviewed for acceptance as a substitute during the addendum process. Manufacturer's listed as "An Acceptable Substitute" are able to bid the project only if equal or better than that specified. Specific items are not reviewed during the substitution process. All items submitted as an "acceptable substitute", shall be reviewed during the submittal process and may or may not be approved for project use. It is the responsibility of the contractor to ensure substituted items are equal to that specified.

CHANGE ORDERS

All supplemental cost proposals by the Contractor shall be accompanied by a complete itemized breakdown of labor and materials without exception. At the Architect's request, the contractor's estimating sheets for the supplemental cost proposals shall be made available to the Architect. Labor must be separated and allocated for each item of work.

RECORD DOCUMENTS

Maintain a set of record drawings as directed in Division 1.

Keep Drawings clean, undamaged, and up to date.

Record and accurately indicate the following:

Depths, sizes, and locations of all buried and concealed conduits/cables.
Changes, additions, and revisions due to change orders, addenda, obstructions, etc. Eradicate extraneous information.

Make Drawings available when requested by Architect for review.

Submit as part of the required Project Closeout documents as indicated in Division 1.

Use standards set in contract documents. Note field modifications, all addenda and change order items on project record drawings. If deficiencies are found in either the quality or the accuracy of the drawings, they will be returned unapproved. Additional review of subsequent submissions shall be at the contractor's expense.

OPERATING AND MAINTENANCE DATA

Upon completion of Contract and after no further action is noted as being required on catalog data submitted for review, submit multiple sets of Operating and Maintenance Manuals for inclusion in Owner's Maintenance Brochure as specified in Division 1. Operation and maintenance manuals shall include descriptive and technical data, maintenance and operation procedures, wiring diagrams, spare parts lists, service representatives, supplier for replacement parts, etc. Bind each set of Operating and Maintenance Manuals in 3-ring, vinyl or canvas covered, loose leaf binders organized with index and thumb-tab marker for each classification of equipment or data.

OPERATING AND MAINTENANCE INSTRUCTIONS

At the completion of the project, at a time scheduled by the Owner, assemble key mechanics, subcontractors, vendors, factory representatives and similar personnel required to explain all facets of maintenance and operation of the installed system to the Owner's personnel. Instructions shall include actual operation of systems and methods of maintenance.

ALTERNATE BIDS

Refer to Division 1 for possible effect upon Work of this Division.

WARRANTY

Furnish, prior to application for final payment, three copies of written and signed guarantee effective a period of one year from date of completion and acceptance of entire project; agree to correct, repair and/or replace defective materials and/or equipment or the results of defective workmanship without additional expense to the Owner. Where no response satisfactory to the Owner has occurred within three working days from the written report of a warranty covered defect, the contractor shall agree to pay for the cost of repair of the reported defect by a contractor of the Owner's choice.

Where the manufacturer's guarantee exceeds one year, the longer guarantee shall govern and include the Contractor's labor.

PART 2 - PRODUCTS**MATERIALS**

All electrical products installed in this project shall be listed by Underwriters Laboratories, Inc., or be approved in writing by the local inspection authority as required by governing codes and ordinances.

All material shall be new and bear manufacturer's name, model number, electrical characteristics and other identification, and shall be the standard product of manufacturer regularly engaged in production of similar material.

All materials shall be of manufacturer's latest design, and of the best quality. The materials shall be manufactured in accordance with applicable standards listed under Quality Assurance.

ACCESS PANELS

Provide panels of adequate size for equipment requiring service and installed above plaster or gypsum board ceilings, behind walls or in furring. Furnish complete with correct frame for type of building construction involved. Size, number and location of access panels is not necessarily shown on Drawings. Use no panel smaller than 12" x 12" for simple manual access, nor smaller than 16" x 20" where personnel must pass through. Milcor Style A, K, L, or M panels or equivalent Bilco or Potter-Roemer as required by construction. Access panels shall maintain ceiling fire rating.

PAINTING

The work of this Division includes painting of the electrical items. All exposed conduits, boxes, surface raceways, etc. shall be painted per the Architect's direction. See Division 9 for additional painting requirements.

FIRE RATINGS

Electrical items (light fixtures, boxes, etc.) recessed into fire rated walls or ceilings shall be alcoved in gypsum board enclosures or be UL listed to maintain the fire rating.

PART 3 - EXECUTION**LAYOUT AND COORDINATION**

The Contractor shall inspect the job site prior to bidding and become familiar with existing conditions which will affect his work. The Drawings are diagrammatic indicating approximate location of outlets, lighting fixtures, electrical equipment, etc. Consult the Architectural, Structural and Mechanical Drawings to avoid conflicts with equipment, structural members, etc. When required, make all deviations from Drawings to make the work conform to the building as constructed, and to related work of others. Minor relocations ordered prior to installation may be made without added cost to the Owner.

Obvious omissions from Drawings or Specifications or differences between Drawings and Specifications shall be called to the Architect's attention at least ten (10) days prior to the bid date for clarification. Failure to do so will be construed as the willingness of this Contractor to supply all necessary materials and labor required for the proper completion of this work in a manner approved by the Architect.

Call to the attention of the Architect any error, conflict or discrepancy in Drawings and/or Specifications. Do not proceed with any questionable items of work until clarification of same has been made.

Supplementary details and plans may be supplied as required and they will become a part of the Contract Documents.

Work under this Division shall be conducted in a manner to cooperate with all other trades for proper installation of all items of equipment.

Coordination of work with other crafts employed on the project is mandatory. Arrange work to reduce interruption of existing services to minimum. When interruptions are unavoidable, consult Architect and utilities involved and agree in writing, with copy to the Architect, upon a mutually satisfactory time and duration.

Verify the physical dimensions of each item of electrical equipment to fit the available space and promptly notify the Architect prior to roughing-in if conflicts appear. Coordination of equipment to fit the available space and the access routes through the construction shall be the Contractor's liability.

Locations of items shown on the Drawings as existing are partially based on record and other drawings which may contain errors. The Contractor shall verify the correctness of the information shown prior to rough-in or demolition and notify the Architect of any discrepancies.

Coordinate all work and trim with carpet installers. Provide carpet plates on all carpet surfaces, complete as required.

Install equipment such that code-required working clearances are maintained, and allow clearances for future maintenance.

Coordinate installation of electrical conduit, boxes, fittings, anchors, and miscellaneous items to be concealed in precast concrete assemblies.

UTILITY COORDINATION

Utility Coordination: Coordinate all aspects of the incoming electrical utility services indicated with the city engineer and serving utility. Requirements of the utility company which exceed the provisions made on the Drawings or covered by these Specifications shall take precedence. Provisions made on the Drawings or Specifications in excess of the utility company's requirements shall take precedence. No additional compensation will be allowed the contractor for connection fees or additional work or equipment not covered in the Drawings or Specifications which are a result of policies of the serving utilities.

The Contractor shall contact the serving utility representatives and verify if any charges will be rendered against this project. These charges, if any, shall be included within the basic bid figure.

EXCAVATING AND BACKFILL

Provide trenching, backfilling, compaction, repaving or other site restoration as required by the work done in this Division. Minimum trench depth shall be 36" unless otherwise noted. Install 6" wide red vinyl tape with lettering "Caution: Buried Electric Line Below" 18" above all buried electric lines in this contract.

Excavating and backfilling required for installation of electrical work shall be performed in accordance with requirements specified in Division 2. Backfill in excavations outside of building may be excavated material from site containing no rocks over 3/4" in diameter.

Provide all necessary backfill materials, whether from site excavations or from off-site borrows, to completely fill excavations. Coordinate patching of all asphalt or concrete surfaces disturbed by this work with the Owner.

Bored Crossings: Casing shall be smooth steel pipe fabricated in sections for welded joints, of size sufficiently large to provide adequate working space to properly install conduits, continuous butt welded at joints for rigid, watertight encasement, minimum thickness of 0.188" for casing under 14" diameter, and 0.281" for casings 14" and larger diameter.

PROTECTION OF WORK

Protect electrical work, wire and cable, materials and equipment installed under this Division against damage by other trades, weather conditions or any other causes. Equipment found damaged or in other than new condition will be rejected as defective.

Panels, light fixtures and electrical equipment shall be kept covered or closed to exclude moisture, dust, dirt, plaster, cement, or paint and shall be free of all contamination before acceptance. Enclosures and trims shall be in new condition, free of rust, scratches or other finish defects. Properly refinish in a manner acceptable to the Architect if damaged.

Including products of other Sections, clean, repair and touch-up or replace when directed, products which have been soiled, discolored or damaged.

Provide for dehumidification of equipment during construction when directed by Architect.

Remove debris from project site upon completion or sooner if directed.

GENERAL INSTALLATION METHODS

Provide raceways and conduits for all electrical system wiring as specified herein. Class II or III systems wiring installed per Article 725 of NEC will be required to be installed in raceway unless otherwise indicated. When open wiring is permitted, raceways will be required in insulated walls and in other inaccessible areas. Low voltage wiring installed in return air plenums shall utilize plenum rated cable.

The extent of the branch circuiting and control wiring shown shall not be changed.

Cross or hash marks on power and lighting conduit runs indicate quantity of No. 12 minimum copper branch circuit conductors unless otherwise noted. Where such marks do not appear, provide conductors as required to provide an operable system, sized per local codes.

Repair surfaces damaged during installation to match adjacent undisturbed areas. Surface preparation, including cleaning and priming, shall be in accordance with the paint manufacturer's requirements.

Adjacent panelboards, component cabinets, terminal cabinets, and wire gutter exposed in finished areas shall have matching trim and finish.

In general, the mounting heights shall be as noted on the Drawings or as listed below. Where no heights are indicated, request clarification from the Architect. Consult the Architectural, Structural, and Mechanical Drawings to avoid conflicts prior to roughing in. All dimensions are to the center of the device above finished floor unless specified otherwise. Lighting dimensions are to the bottom of suspended fixtures; mount panelboards 72" to top handle; mount devices above counters, 12" above counter or 4-1/2" above backsplash, whichever is greater; and receptacles in unfinished areas 48".

All raceways and wiring shall be concealed where possible. All wiring devices, recessed light fixtures, etc., shall be flush mounted unless otherwise noted.

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Relays, panels, cabinets and equipment shall be level and plumb and installed parallel with structural building lines. All equipment and enclosures shall be suitable for the environmental conditions in which they will operate.

The Drawings do not indicate all items necessary. Provide associated equipment, materials, and labor as required for complete and operable systems.

CUTTING AND PATCHING

Under no conditions are beams, girders, footings or columns to be cut for electrical items unless so shown on Drawings or written approval obtained from the Architect.

Cutting, patching and repairing for the proper installation and completion of the work specified, including plastering, gypsum board, masonry work, concrete work, carpentry work and painting shall be performed by workers skilled in their respective trades.

Follow requirements specified in Division 1.

SLEEVES AND CHASES

Provide necessary rigid conduit sleeves, openings and chases where conduits or cables are required to pass through floors, ceilings or walls. Seal all openings around conduits against leaks and in a manner to maintain the fire rating of the structure penetrated. Prevent unnecessary cutting in connection with the finished work. Make all repairs and seals in a manner acceptable to the Architect.

NOISE CONTROL

The entire electrical system apparatus shall operate at full capacity without objectionable noise or vibration.

Outlet boxes at opposite sides of partitions shall not be placed back-to-back, nor shall straight-through boxes be employed, except where specifically permitted on the Drawings by note, to minimize transmission of noise between occupied spaces.

Contactors, transformers, starters, and similar noise-producing devices shall not be placed on walls which are common to occupied spaces unless specifically called for on the Drawings. Where such devices must be mounted on walls common to occupied spaces, they shall be shock mounted or isolated in such a manner as to effectively prevent the transmission of their inherent noise to the occupied space.

Ballasts, contactors, starters, transformers, and like equipment which are found to be noticeably noisier than other similar equipment on the project will be deemed defective and shall be replaced.

EQUIPMENT CONNECTIONS

Provide complete electrical connections for all items of equipment requiring such connections, including incidental wiring, materials, devices and labor necessary for a finished working installation.

Verify the rough-in and wiring requirements for all equipment provided under other Divisions of the work and requiring electrical connections with equipment supplier and installer prior to rough-in. Check the voltage and phase of each item of equipment before connecting. Motor connections shall be made for the proper direction of rotation. Pump motors shall not be test run until liquid is in the system and proper lubrication to all bearings in unit is checked. Minimum size flex for mechanical equipment shall be 1/2". Exposed motor wiring shall be jacketed metallic flex.

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Conduit, wire and circuit breaker sizes for mechanical equipment and equipment furnished under other Divisions are based on the equipment ratings of one manufacturer. The equipment actually furnished may be of a different brand with different electrical characteristics. Conduit, wire and circuit breakers shall not be ordered or installed until exact electrical requirements are obtained. Responsibility for this coordination shall rest with the Contractor.

TESTS

Complete each system as shown or specified herein and place in operation except where only roughing-in or partial systems are called for. Each system shall be tested and left in proper operation free of faults, shorts, or unintentional grounds.

After the interior wiring system installation is completed, and at such time as the Owner may direct, the Contractor shall conduct an operating test for approval. The equipment shall be demonstrated to operate in accordance with the requirements of the Specification. The test shall be performed in the presence of the Owner or an authorized representative. The Contractor shall furnish all instruments and personnel required for the tests, and the Owner will furnish the necessary electric power. The Contractor shall submit in writing to the Owner upon completion of the project the measured ground resistance of each ground rod, indicating the location of the rod, the resistance, and the soil conditions at the time the measurements were made.

END OF SECTION

SECTION 16110 – CONDUITS, RACEWAYS AND FITTINGS

PART 1 - GENERAL

DESCRIPTION

Provide all raceways and fittings of specified type required for complete project. Install all systems in raceways unless specifically noted otherwise.

QUALITY ASSURANCE

Underwriters Laboratories, Inc., listed and NEC approved.

PRODUCT DELIVERY, STORAGE, AND HANDLING

Deliver raceways with Underwriters Laboratories, Inc., label and bearing manufacturer's name on each length.

Deliver fittings in manufacturer's original unopened and undamaged packages with labels legible and intact.

APPLICATION

Areas of use:

Underground	PVC
Within poured Concrete (except slab-on grade) or CMU	GRC, IMC, PVC
Dry concealed locations	GRC, IMC, EMT
Wet or Dry exposed locations, subject to damage	GRC, IMC
Dry exposed locations, not subject to damage	GRC, IMC, EMT
Hazardous Class I or II	GRC, IMC

Underground conduit shall be minimum 3/4" trade size. PVC shall not be used inside building. Unless otherwise approved, all conduits shall be installed under reinforcing steel.

Where the contractor elects to utilize PVC in lieu of GRC, the contractor shall provide supplemental ground bus in terminating switch and panelboards, and green ground wire in conduit according to code rules.

For the purposes of this section, poured concrete slabs on grade and under-the-building slabs are not classified as dry locations.

Flexible metal conduit will be permitted only where flexibility is necessary. Exceptions are connections to recessed light fixtures. Flexible metal conduit shall be used for connection to all equipment subject to movement or vibration such as motors, transformers, etc. Liquid-tight flexible metal conduit shall be used when moisture may be present and for exposed motor and equipment connections.

Surface raceway may be used only where specifically called for on the Drawings or in the Specifications.

Aluminum conduit is not permitted.

SUBMITTAL AND RECORD DOCUMENTATION

Submit product data for surface raceway and wireway.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

Allied Tube & Conduit, Western Tube & Conduit, Triangle, Bridgeport, AFC, Carlon, Western Plastics, Alfalex, or approved substitute. Wiremold, Walker, or approved substitute.

CONDUITS

Galvanized Rigid Conduit (GRC) shall be hot-dip zinc, galvanized inside and out, mild steel pipe manufactured in accordance with UL-6 and ANSI C80.1. All threads shall be galvanized after cutting.

Electrical Metallic Tubing (EMT) shall be steel only and shall comply with UL-797 and ANSI C80.3. Exterior shall be hot-dip zinc galvanized and interior protected by a corrosion-resistant lubricating coating.

Intermediate Metallic Conduit (IMC) shall comply with UL-1242 and ANSI C80.6. Exterior shall be hot-dip zinc galvanized and interior protected by a corrosion-resistant lubricating coating.

Rigid non-metallic conduit (PVC) polyvinyl chloride shall be schedule 40 unless otherwise noted, and shall comply with UL-651 and NEMA TC 2.

Surface raceway shall utilize snap-in cover and fittings as recommended by the manufacturer and shall comply with UL 5 standard. Material and size shall be as indicated on the Drawings.

Flexible metal conduit shall be steel and comply with UL 1 and ANSI standards. Liquid-tight flexible metal conduit shall comply with UL 360 and ANSI standards.

WIREWAYS

Gutters: Steel, painted, square in cross section, preformed knockouts on standard spacing, screw cover, suitable for environment.

Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for a complete system.

FITTINGS

GRC and IMC shall be coupled and terminated with threaded fittings. Ends shall be bushed with insulating bushings equal to T&B 1220 or 1230 series.

Connectors and couplings for EMT shall be steel concrete tight compression type or set screw type with insulated throats on connectors. Indent type connectors shall not be used.

Conduits piercing a building waterproof membrane shall be provided with O-Z type FSR fittings.

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Flexible metal conduit shall utilize screw-in type connectors. Couplings and set-screw type connectors are not permitted.

Seal-offs with filler fiber, compound, large removable cover. All components shall be of the same manufacturer.

Expansion Couplings:

Exposed Conduit Runs: Expansion couplings shall be weatherproof with external bonding jumper, providing at least 4" longitudinal movement with bushed conduit ends.

Concealed Conduit Runs: Expansion couplings shall be water tight with an internal bonding jumper and neoprene construction. The fitting shall allow 3/4" movement in any direction or deflection of 30 degrees from normal.

Locknuts shall be galvanized steel.

PART 3 - EXECUTION**INSTALLATION**

Ends of metal conduits shall be reamed and left free of burrs.

Provide pull boxes or vaults where shown or required to limit the number of bends in any conduit to not more than three 90 degree bends, or to ease pulling tension. Use boxes of code-required size with removable covers, installed so that covers will be accessible after work is completed.

Conceal all wiring in finished spaces so far as practicable. Exposed conduit shall be used only in unfinished spaces.

Exposed raceways shall be parallel or at right angles to structural lines, and shall be neatly offset into boxes. Exposed raceways shall follow existing exposed piping/ductwork/conduit paths as far as practicable.

Conduit stubbed from a concrete slab or wall to serve an outlet mounted on a table or to supply a machine shall have a rigid conduit coupling flush with the surface of the slab. Provide plug where conduit is to be used in future.

Keep conduit and raceway closed with suitable plugs or caps during construction to prevent entrance of dirt, moisture, concrete or foreign objects. Raceways shall be clean and dry before installation of wire and at the time of acceptance.

Remove all foreign matter from raceways and pull mandrel through conduits larger than 1-1/2" prior to installing conductors.

Where no conduit size is noted on the Drawings, conduit may be the minimum code permitted size for the quantity of type THHN conductors installed, but in no case smaller than 1/2" trade diameter. Conductor quantities indicated in conduits do not include ground wire unless otherwise noted. Adjust conduit sizes accordingly.

Where the contractor elects to combine branch circuit runs shown as separate runs on the Drawings, provide a minimum 3/4" conduit or increase raceway size to provide a minimum of 25 percent spare capacity for future conductors. Feeder runs shall not be combined.

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All conduits installed in concrete construction, underground, or under the building slab shall be minimum 3/4", unless otherwise noted.

Assemble, glue and seal PVC conduit in straight lengths prior to installation in trench.

Seal-offs shall be installed in all conduits which route from warm areas into refrigerated areas.

Install PVC conduit in accordance with manufacturer's instructions. Cut the conduit ends square and apply an approved solvent to clean the joint. Apply an approved cement and allow to set 24 hours before installing conductors.

Conduits shall be fastened to all sheet metal boxes and cabinets with two locknuts where required by the National Electrical Code, where insulating bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, a single locknut and bushing may be used.

A pull wire shall be inserted into each empty raceway in which wiring is to be installed by others. The pull wire shall be of No. 15 AWG zinc-coated steel, or of plastic having not less than 200-pound tensile strength. Not less than 10" of slack shall be left at each end of the pull wire.

Raceway shall not be installed under the fire pits of boilers and furnaces and shall be kept 6" away from parallel runs of flues, steam pipes and hot water pipes.

Changes in direction of runs shall be made with symmetrical bends or cast-metal fittings. Field-made bends and offsets shall be made with an approved hickey or conduit-bending machine. Crushed or deformed raceways shall not be installed.

Expansion fittings complete with grounding jumpers shall be installed where raceways cross expansion joints, construction joints, sawed joints, and where shown.

Where conduit is shown stubbed into a telephone, computer or communication terminal area, conduit shall be stubbed up 6" above floor or 12" below ceiling and terminated with insulating bushings.

Coordinate layout and installation of raceway and boxes with other construction elements to ensure adequate head room, working clearance, and access to both boxes and other equipment.

The end of a conduit stub shall have an insulated bushing.

Pack spaces around conduits with polyethylene backing rods and seal with polyurethane caulking to prevent entrance of moisture where conduits are installed in sleeves or block-outs penetrating partitions.

Install intumescent material around ducts, conduits, etc., to prevent spread of smoke or fire where installed in sleeves or block-outs penetrating fire-rated barriers. An alternate method utilizing intumescent materials in caulk and/or putty form may be used.

INSTALLING CONDUIT BELOW SLAB-ON-GRADE OR IN THE GROUND

All electrical wiring below slab-on-grade shall be protected by a conduit system.

No conduit system shall be installed horizontally within concrete slab-on-grade. For slab-on-grade construction, horizontal runs of rigid plastic shall be installed below the floor slab.

Conduit passing vertically through slab-on-grades shall be coated rigid steel.

Slope conduits away from terminal equipment; drain away from the building interior.

Rigid steel or IMC conduits, metal boxes, and couplings installed below slab-on-grade or in the earth shall be field-wrapped with 0.010" pipe-wrapping plastic tape applied with a 50 percent overlay, or shall have a factory applied plastic resin, epoxy, or coal-tar coating system. Zinc coating may be omitted from rigid steel conduit, or IMC which has a factory-applied epoxy system. All joints shall be threaded, sealed and wrapped with tape to prevent entry of water. Use 20 mil pipe wrapping tape to cover wrench marks, field cuts, or abrasions to the outer factory installed anti-corrosion covering.

Provide duct seal at ends of all underground and under-slab conduits.

END OF SECTION

SECTION 16120 - CONDUCTORS**PART 1 - GENERAL****DESCRIPTION**

Provide all conductors, cables, connectors, lugs, cable ties, and terminations for all systems.

QUALITY ASSURANCE

All conductors shall be Underwriters Laboratories, Inc., listed and comply with Fed. Spec. J-C-30B and UL 83. Materials omitted here but necessary to complete the work are to be of comparable quality.

PRODUCT DELIVERY, STORAGE & HANDLING

Deliver conductors and cables in complete coils with UL label and bearing manufacturer's name, wire size, and type of insulation.

Store and handle materials so as not to subject them to corrosion or mechanical damage and in a manner to prevent damage from environment and construction operation.

Deliver conductors No. 10 and smaller in manufacturer's original unopened and undamaged cartons with labels legible and intact.

SUBMITTAL AND RECORD DOCUMENTATION

None required.

PART 2 - PRODUCTS**CONDUCTORS**

Conductors No. 10 AWG and smaller may be soft-drawn, stranded, or solid copper. Conductors larger than No. 10 AWG shall be stranded, soft-drawn copper.

Insulation for new conductors installed in raceways shall be "THWN" for conductors No. 8 AWG or smaller, and "THWN" or "THHN" for conductors No. 6 AWG or larger, or as noted.

Where adverse conductor exposure exists, code-approved insulation suitable for the conditions encountered shall be used unless shown otherwise on the Drawings.

All wire and cable for feeder circuits shall conform to the latest requirements of the current edition of the NEC and shall meet all ASTM Specifications. Wire and cable shall be new and have wire size, grade of insulation, voltage, and manufacturer's name permanently marked on outer covering at regular intervals.

Sizes shall not be less than indicated. Branch circuit conductors shall not be smaller than No. 12 AWG. Class I remote control and signal circuit conductors shall not be less than No. 14 AWG. Class 2 low energy remote control and signal circuit conductors shall not be less than No. 18 AWG.

All insulation shall be rated 600 volts unless noted otherwise.

Acceptable Manufacturers: General Electric, Hatfield, Anaconda, Rome Cable, Belden, West Penn, or approved.

SPLICES AND TERMINATIONS

All connectors shall be solderless pressure type per Fed. Spec. W-S-610, properly taped. All taped joints shall be with plastic tape, "Scotch 33," applied in half-lap layers without stretching to deform.

Splices shall utilize Scotch "Hyflex" or "Ideal" wing nut connector installed properly. Splices for No. 8 and larger wires shall be made with tin or silver plated copper compression sleeves.

Terminate feeder conductors with indent/compression lugs. Set screw lugs are not permitted.

Splices made in handholes and manholes, or underground splices, shall be made water tight with epoxy resin-type splicing kits.

Ground the shield of twisted, shielded pairs at one end only.

PART 3 - EXECUTION**CONDUCTORS**

Insulation shall be removed with a stripping tool designated specifically for that purpose. All conductors shall be left nick-free.

UL listed pulling compounds may be used with the residue cleaned from the conductors and raceway entrances after the pull is made.

Raceway shall be complete, clean and free of burrs before pulling conductors.

Wire shall not be left extending out of exposed conduit stubs or incomplete raceways where subject to mechanical injury.

Pulleys or blocks shall be used for alignment of the conductors when pulling. Pulling shall be in accordance with manufacturer's specifications regarding tensions, bending radii of the cable and compounds.

Conductors shall be terminated as required.

Conductor sizes for special systems shall be as recommended by the equipment manufacturer except as noted.

Stranded conductors shall not be terminated with post and screw unless compression spade/ring lug is utilized.

120-volt homeruns over 80 feet in length shall be minimum #10 conductor.

LABELING

Provide color coding of building wiring consistent throughout the work as listed herein, unless required otherwise by local code authority. Band feeder conductors not available in colors where clearly visible at each termination, tape or splice using two full wraps of 3/4" adhesive vinyl tape or equally visible color marking corresponding to the following table.

Less than 250V between phases

Phase A - Black

Phase B - Red

Phase C - Blue

Neutral - White

Ground - Green

Switch legs, travelers, etc., to be consistent with the above phases to which they are connected or may be any other color distinctive from those listed above. Complex control circuits may utilize any combination of colors but the identification shall be by labels throughout. Labeling shall be accomplished by using computer-generated heat shrink labels suitable for the wire size used. In no case will hand lettering or wraparound labels be accepted.

Phase color code to be consistent at all feeder terminations, A-B-C left to right or A-B-C top to bottom.

Conductor identification shall be provided within each enclosure where a tap, splice, or termination is made.

Control circuit terminals of equipment shall be properly identified. Terminal and conductor identification shall match that shown on approved shop drawings. Hand lettering or marking is not acceptable.

SPLICES AND TERMINATIONS

Splices are to be made up completely promptly after wire installation. Single wire pigtails shall be provided for fixture and device connections. Wire nuts may be used for fixture wire connections to single wire circuit conductor pigtails.

CONNECTORS

Control and special systems wires shall be terminated with a tool- applied, spade-flared lug when terminating at a screw connection.

All screw and bolt-type connectors shall be made up tight and be retightened after an eight-hour period.

All tool-applied compression connectors shall be applied per manufacturer's recommendations and physically checked for tightness.

Check terminations in all main disconnect panelboards, etc., six months after completion of installation. Supply a confirming letter to the Owner at completion of test.

END OF SECTION

SECTION 16130 - BOXES**PART 1 - GENERAL****DESCRIPTION**

The requirements of this section apply to electrical boxes. Provide all outlet boxes, junction boxes, pull boxes and special boxes required for pulling of wires, making connections, and mounting of devices or fixtures.

QUALITY ASSURANCE

All boxes shall be Underwriters Laboratories, Inc., listed. Where special fabrication is required, the work shall be performed by a listed facility in accordance with UL 50, and all products of manufacture shall bear a label. Outlet and junction boxes shall be sized in accordance with NEC requirements for "THHN" wire or as noted on Drawings.

SUBMITTAL AND RECORD DOCUMENTATION

Submit product data for floor boxes. Submit shop drawings for nonstandard boxes, enclosures, and cabinets. Include layout drawings showing components and wiring.

PART 2 - PRODUCTS**BOXES**

Boxes for use with raceway systems shall not be less than 4" square and 1-1/2" deep except where shallower boxes required by structural conditions are approved.

Flush and Concealed Outlet Boxes: Galvanized stamped steel with screw ears, knock-out plugs, mounting holes, fixture studs if required.

Surface Outlet Boxes: Galvanized stamped steel same as above for use on ceilings and walls above 14 feet.

Boxes shall be of the cast-metal hub type when located in normally wet locations and when surface mounted on outside of exterior surfaces.

Boxes installed for concealed wiring shall be provided with suitable extension rings or plastic covers as required.

Cast-metal boxes installed in wet locations and boxes installed flush with the outside of exterior surfaces shall be gasketed.

Provide boxes suitable for the intended environment and sized as required to accommodate the equipment within.

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Pull boxes of not less than the minimum size required by the National Electrical Code shall be constructed of code-gauge aluminum or galvanized sheet steel except where cast-metal boxes are required in locations specified above. Boxes shall be furnished with screw-fastener covers. Where several feeders pass through a common pull box, the feeders shall be tagged to indicate clearly the electrical characteristics, circuit number, and panel designation.

PART 3 - EXECUTION

MOUNTING

Outlet boxes shall be designed for the intended use. Flush outlet boxes shall be installed flush with finished surface lines.

Outlet boxes on flex connected fixtures shall be installed within five feet of conduit knock-out in fixture.

INSTALLATION

Coordinate layout and installation of raceway and boxes with other construction elements to ensure adequate head room, working clearance, and access to both boxes and other equipment.

END OF SECTION

SECTION 16140 – WIRING DEVICES**PART 1 - GENERAL****DESCRIPTION**

Provide all wiring devices and finish plates as required unless specifically indicated otherwise.

QUALITY ASSURANCE

Underwriters Laboratories, Inc., listed and NEC approved.

Wiring devices shall be specification grade, with special devices as noted on the Drawings. Should the Drawings indicate a device other than those listed herein, such device shall be of same grade and manufacture as specified below.

All lighting switches and duplex receptacles installed shall be from the same manufacturer and have identical appearance characteristics.

SUBMITTAL AND RECORD DOCUMENTATION

Submit product data for wiring devices and cover plates.

PART 2 - PRODUCTS**MATERIALS**

Wall Switches: 20 ampere, 120/277 volt AC, quiet type, Hubbell 1221 Series, color as selected by Architect. Single pole, double pole, 3-way, locking, or other type as indicated. Switches on emergency power shall be 'Red' in color.

Receptacles: Single and duplex receptacles shall be rated 20 amperes, 125 volts, two-pole, three-wire, grounded type, Hubbell 5362 Series. Receptacles shall have nylon faces, one-piece brass mounting strap with integral ground contacts and bypass power contacts; color as selected by Architect. Receptacles on emergency power shall be 'Red' in color.

Receptacles with ground fault interrupters shall be in accordance with UL 943.

Special purpose or heavy duty receptacles shall be of the type and of ratings and number of poles indicated or required for the anticipated purpose. Contact surfaces may be either round or rectangular. One appropriate straight or angle-type plug shall be furnished with each receptacle. Locking facilities, where indicated, shall be accomplished by the rotation of the plug.

Device plates of the one-piece type shall be provided for all outlets and fittings to suit the devices installed. Plates on unfinished walls and on fittings shall be of zinc-coated sheet steel, cast metal, or impact resistant plastic having rounded or beveled edges. Plates on finished walls shall be impact resistant plastic. Color as selected by the Architect.

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Receptacles in wet locations shall be in a weatherproof enclosure, the integrity of which is not affected when the receptacle is in use. The enclosure shall be of high-impact polycarbonate construction, with a keyhole hinge without a spring and other metal parts, with a gasketless translucent lid that is lockable and tinted and has large cord openings. The enclosure shall be one or two-gang, and shall be securely secured to the receptacle box with tamper-proof fasteners through factory-drilled or field-drilled through factory-prepared drill points.

Bell "Rayntite II" or equal.

ACCEPTABLE MANUFACTURERS

Hubbell, Bryant, P&S, Leviton, and Cooper.

PART 3 - EXECUTION**INSTALLATION**

Devices and finish plates to be installed plumb with building lines.

Finish plates and devices not to be installed until final painting is complete. Scratched or splattered finish plates and devices will not be accepted.

Wall mounted receptacles shall be installed vertically at centerline height shown on the Drawings unless otherwise specified.

Plates shall be installed with all four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings will not be permitted. Plates shall be installed with an alignment tolerance of 1/16 inch.

All outlets shall have a cover plate. Provide blank cover plate to match surrounding area if none other is specified.

TESTS

Test all receptacles for line to line, line to neutral, line to ground, and neutral to ground, opens or shorts, and correct defective wiring.

LABELING

See Section 16195, Electrical Identification.

END OF SECTION

SECTION 16170 – CIRCUITS AND MOTOR DISCONNECTS**PART 1 - GENERAL****DESCRIPTION**

Provide disconnect switches as indicated on the Drawings, in the Specifications, and where required by the National Electrical Code, even though not indicated. Provide fused or unfused switches as required by equipment manufacturer or circuit requirements.

QUALITY ASSURANCE

Underwriters Laboratories, Inc., listed.

SUBMITTAL AND RECORD DOCUMENTATION

Provide outline drawings with dimensions, and provide equipment ratings for voltage, amperage, horsepower, and short circuit.

PART 2 - PRODUCTS**DISCONNECTS**

Enclosed safety switches shall be horsepower rated in conformance with Table III or Fed. Spec. W-S-865. Switches shall disconnect all ungrounded conductors.

Safety and disconnect switches shall be NEMA type HD (heavy duty), quick-make, quick-break, dual rated with electrical characteristics as required by the system voltage and the load served. Switches shall be equipped with a defeatable cover interlock. Operating handles shall be located to side of switches.

Enclosures shall be NEMA 1 for indoor use, unless specifically noted otherwise, NEMA 3R where installed exposed to the weather or designated by the subscript "WP," and explosionproof where designated with the subscript "EP" or as required by the environment.

Disconnects shall be fusible or non-fusible. Equip all fusible disconnects with dual element fuses required by the equipment served. Coordinate fuse sizes at the time equipment is connected. Adjust fuse sizes if necessary to accommodate actual equipment installed. In no case shall fuses be sized smaller than the starter heaters on motor circuits.

For single-phase motors, a single- or double-pole toggle switch, rated only for alternating current will be acceptable for capacities less than 30 amperes, provided the ampere rating of the switch is at least 125 percent of the motor rating.

All disconnects shall be of same manufacturer.

Switches identified for use as service equipment are to be labeled for this application.

ACCEPTABLE MANUFACTURERS

Square D, Siemens, Cutler-Hammer/Westinghouse, and GE approved.

PART 3 - EXECUTION

INSTALLATION

Install safety and disconnect switches where indicated, in accordance with the manufacturer's written instructions, the applicable requirements of NEC and the National Electrical Contractors Association's "Standard of Installation," and in accordance with recognized industry practices to ensure that products serve the intended function.

Install disconnect switches used with motor-driven appliances, motors, and controllers within sight of the controller position and within 25 feet.

END OF SECTION

SECTION 16190 – SUPPORTING DEVICES**PART 1 - GENERAL****DESCRIPTION**

Provide all electrical equipment and wiring with adequate supports of specified type required for a complete installation.

SUBMITTAL AND RECORD DOCUMENTATION

Submit shop drawings indicating details of fabricated products and materials.

PART 2 - PRODUCTS**FASTENERS**

Fastenings shall be by wood screws or screw-type nails to wood; by toggle bolts on hollow masonry units; by expansion bolts on concrete or brick; by machine screws, welded threaded studs, heat-treated or spring steel tension clamps on steel work; for new concrete installation use cast-in-concrete inserts. Kindorf D-255 or approved.

Hammer-driven and trigger-fired anchors may be used only after obtaining specific written authorization from the Architect.

OUTLET BOX SUPPORTS

Wood Stud Walls: Adjustable bar hangers with "C" channel cross section Steel City 6010 series, or approved, or mounted on solid blocking. 4-inch square boxes adjacent to wood studs may be side nailed and back braced with Steel City No. 50 box brace.

Light steel construction, bar hangers with 1-inch long studs between metal studs or metal stud "C" brackets snapped on and tab-locked to metal studs.

Concrete or masonry walls where boxes are not cast in place. Flush anchors or concrete inserts.

Flush Ceiling Outlets: Steel City 6010 series or equal bar hangers.

CONDUIT SUPPORTS

One Hole Malleable Straps: Steel City, Appleton, T&B, Diamond, Raco, or approved.

Conduit Clips: Caddy, Raco, or approved.

Nail-Up Straps: 1/2" through 1", Raco 2252, 2253, 2254, or approved.

Adjustable Hangers for Conduits 1-1/2" and Larger: Steel City C-149 with threaded steel rod of proper size.

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Adjustable trapeze hangers to support groups of parallel conduits; Steel City B-905 steel channel, H-119 square washer, C-105 strap, threaded rod. Components of Unistrut, Globe Strut, Harvey Alstrut, Kindorf, or approved.

HANGER ROD ATTACHMENTS

Side Beam Connector, Kindorf E-244; 90 degree fitting, Kindorf B-916; clamp type anchor clips Kindorf Type "C," Unistrut P2675 or approved, spot type concrete insert Kindorf B-255 with "Galv-Krom" finish.

SUPPORT CHANNELS

Conduit: Kindorf B-905 with Galv-Krom finish, and C-105 single bolt channel pipe straps.

Lighting: Kindorf B-900 with G-969 closure strip and G-977 swing connector.

Recessed in Concrete: Kindorf D-980 with D-982 anchored end caps and D-983 joiner clips.

PART 3 - EXECUTION**INSTALLATION**

Every fastening device and support for electrical equipment (includes fixtures, panels, outlets, conduits, and cabinets) shall be capable of sustaining not less than four times the ultimate weight of the object or objects. Fasten support to the building or a building structural member.

Provide independent supports to the building or building structural member for electrical fixtures, materials, or equipment installed in or on ceiling, walls, or in void spaces and/or over the furred or suspended ceilings. Chain or additional ceiling wires may be used for light fixture supports.

Other crafts' fastening devices shall not be used for the supporting means of electrical, equipment, materials, or fixtures.

Supports and/or fastening devices shall not be used to support more than one particular item.

Vertical support members for equipment and fixtures shall be straight and parallel to building walls.

Examine all equipment locations to determine type of supports required.

Raceways or pipe straps shall not be welded to steel structures.

Holes cut to a depth of more than 1-1/2" in reinforced concrete beams or to a depth of more than 3/4" in concrete joists shall avoid cutting the main reinforcing bars. Holes not used shall be filled.

BOXES

Boxes and pendants for surface-mounted fixtures on suspended ceilings shall be supported independently of the ceiling supports.

In open overhead spaces, cast metal boxes threaded to raceways need not be separately supported except where used for fixture support; cast metal boxes having threadless connectors and sheet metal boxes shall be supported directly from the building structure or by bar hangers.

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Where bar hangers are used, the bar shall be attached to raceways on opposite sides of the box and the raceway shall be supported with an approved fastener not more than 24" from the box.

RACEWAYS

Support conduits within 18" of outlets, boxes, panels, cabinets, couplings, elbows, and deflections. Maximum distance between supports shall not exceed ten (10) foot spacing.

Conduit up to and including 1" EMT may be supported from ceiling fixture wires by conduit clips or other approved devices only with written approval of the installer of the ceiling support system. All other conduit runs shall be secured to the structure by two-hole straps or supported on Kindorf or Unistrut hangers. Wire will not be permitted for supporting conduit. All visible conduit runs will be parallel to the building structural lines.

Anchor conduit installed in poured concrete to the steel reinforcing with No. 14 black iron wire.

In partitions of light steel construction, sheet metal screws may be used, and bar hangers may be attached with saddle-suspended ceiling construction only. Lighting system branch circuit raceways shall be fastened to the ceiling supports.

Support suspended feeder conduits by metal ring or trapeze hangers with threaded steel rods. Wire ties to prevent displacement, using not less than No. 14 iron wire, may be used only for concealed runs in concrete for conduit up to 1-1/4".

At main distribution and surface mounted branch panels and cabinets where conduit exits from the top, provide support channels on wall 24" above panel and at 6'-0" intervals from there on for support of conduits.

END OF SECTION

SECTION 16195 – ELECTRICAL IDENTIFICATION**PART 1 - GENERAL****DESCRIPTION**

Clearly and properly label the complete electrical system to indicate the loads served or the function of each item of equipment connected under this work.

SUBMITTAL AND RECORD DOCUMENTATION

None required.

PART 2 - PRODUCTS**IDENTIFICATION MARKERS**

Unless otherwise specified, all identification nameplates shall be made of laminated three-ply plastic in accordance with Fed. Spec. L-P-387 equal to "Lamicoid." Nameplates shall be minimum 1/16" thick, with black outer layers and a white core, red outer ply for all emergency applications. Edges shall be chamfered.

Provide identification nameplates for starters, safety switches, panelboards, equipment (air handling units, exhaust fans, pumps, etc.), with a minimum of 1/4" high letters.

Provide identification nameplates for control power transformers, lighting controller, control devices (relays, contactors, etc.), with a minimum of 1/8" high letters.

Where switches control remote lighting, exhaust fans, or power outlets, or where switches in the same gang (two or more) serve different purposes, such as light, power, intercom, etc., or different areas, such as corridor and outlet, furnish engraved cover plates with 1/8" black letters indicating function of each switch or outlet.

PART 3 - EXECUTION**LABELING**

Major items of electrical equipment and major components shall be permanently marked with an identification nameplate to identify the equipment by type or function and specific unit number as shown on the Drawings.

Provide typewritten branch panel schedules with protective clear, transparent covers accounting for every breaker installed. Use actual room designations assigned by name or number near completion of the work, and not the designation on the construction drawings. Minimum panel schedule width shall be 4" with 1/4" height allowed for each circuit line. Panel schedules shall be the type which install in a metal frame or pocket. Panel schedules shall be of the odd/even sequence (1-3-5-7-9... and 2-4-6-8-10...).

Identify service entrance and distribution panels with engraved nameplate corresponding with the plans, mounted on the face of the switchboard. Identify each feeder, breaker, and switch with engraved nameplate corresponding with the plans.

Identify branch panels with engraved nameplate corresponding with the main or subdistribution panel labeling, mounted on the face of the door. No brand labels or other markings shall be on the outside of the panels.

Label all disconnect switches, relays, contactors, starters and time switches indicating voltage, amperage, power panel source, circuit number and equipment served with laminated plastic label.

Nameplates shall be secured with screws or pop rivets. Adhesive-only fasteners shall not be permitted.

END OF SECTION

SECTION 16450 - GROUNDING

PART 1 - GENERAL

DESCRIPTION

Provide ground system as specified herein, as shown on the Drawings, and as required by NEC and other rules and regulations pertaining to grounding.

SUBMITTAL AND RECORD DOCUMENTATION

None required.

PART 2 - PRODUCTS

GROUND CONDUCTORS

Equipment or grounding conductors shall be soft drawn copper, stranded per ASTM B8 and, if insulated, shall have green insulation.

GROUNDING BUSHINGS/WEDGES

Sufficient ampacity with grounding conductor set screw connection.

CONNECTOR

Cast, set screw or bolted type.

GROUND RODS

Copper-clad steel, not less than 3/4" in diameter, 8' long, driven full length into the earth.

PART 3 - EXECUTION

INSTALLATION

All grounding conductors shall be sized in accordance with Article 250, Tables 250-94 and 250-95 of the NEC.

Except where specifically indicated otherwise, all exposed non-current-carrying metallic parts of electrical equipment, metallic raceway systems, and neutral conductor of the wiring system shall be grounded.

The ground connection shall be made at the main service equipment and shall be extended to the point of entrance of the metallic water service. Connection to the water pipe shall be made by a suitable ground clamp. If flanged pipes are encountered, connection shall be made with the lug bolted to the street side of the flange connection.

Where the metallic water service is used, it shall be grounded as described by Article 250-81 of the NEC.

Generally, all supplemental grounding electrodes shall be ground rods.

All ground wire connections below finished grade, cast in concrete, or bonding solid wire shall be exothermically welded.

Where there is no metallic water service to the building, ground connections shall be made to driven ground rods on the exterior of the building.

The maximum resistance measured in accordance with IEEE Standard 142 of a driven ground shall not exceed 25 ohms under normally dry conditions. If this resistance cannot be obtained with a single rod, additional rods shall be installed not less than 6' on centers, or if sectional-type rods are used, additional sections may be coupled and driven with the first rod. If the resultant resistance exceeds 25 ohms measured not less than 48 hours after rainfall, the Engineer shall be notified immediately.

Grounding conductor connectors shall be made up tight and located for future servicing and to ensure low impedance.

The Contractor shall submit in writing to the Owner upon completion of the project the measured ground resistance of each ground rod, indicating the location of the rod and the resistance and the soil conditions at the time the measurements were made.

Where new circuits are to be served by existing panels with no ground bus, provide supplemental copper ground bus in panel.

END OF SECTION

SECTION 16475 – OVERCURRENT PROTECTIVE DEVICES**PART 1 - GENERAL****DESCRIPTION**

At all locations shown, provide overcurrent protective devices of the size and type as specified on the Drawings and in the Specifications.

SUBMITTAL AND RECORD DOCUMENTATION

Submit product data for each circuit breaker and fuse type, including descriptive data and time-current curves, let-through current curves for fuses with current limiting characteristics, and coordination charts and tables and related data.

PART 2 - PRODUCTS**CIRCUIT BREAKERS**

Breakers shall be fully interchangeable without disturbing adjacent units, quick-make, quick-break, ambient compensated, and trip indicating. Construction of the breaker shall allow the device to operate manually for normal switching functions and automatically under overload and short circuit conditions. It is to provide circuit and self-protection when applied in its ratings. The operating mechanism shall be entirely trip-free so that contacts cannot be held closed against an abnormal overcurrent or short circuit condition.

The operating handle of the breaker shall open and close all poles simultaneously. The trip unit for each pole shall have elements providing inverse time delay under load condition and instantaneous magnetic tripping for short circuit protection. The trip element shall operate a common trip bar which shall open all poles in case of an overload or short circuit through any pole. Provide ground fault interrupter breakers where required by code or shown on Drawings.

Circuit breakers and switches used for motor disconnects and not in sight of the motor controller shall be capable of being locked in the open position.

Molded case circuit breakers shall be switch rated, bolt-on type.

Circuit breakers downstream from a fuse or circuit breaker shall be tested, listed, and marked by UL for series rating with the specific upstream fuse or circuit breaker to limit the let-through current to below 10,000A RMS symmetrical.

Acceptable Manufacturers: Siemens, Square D, Cutler-Hammer/Westinghouse, and GE.

FUSES

Fuses shall be Class RK1 or J, dual element, non-renewable type unless indicated otherwise on drawings.

Acceptable Manufacturers: Bussman, Littelfuse, and Gould-Shawmut.

PART 3 - EXECUTION

INSTALLATION

Install overcurrent protective devices as indicated, in accordance with manufacturer's written instructions and with recognized industry practices to ensure that protective devices comply with requirements. Comply with NEC and NEMA standards for installation of overcurrent protective devices.

Coordinate with other work, including electrical wiring work, as necessary to interface installation of overcurrent protective devices with other work.

Fasten circuit breakers without causing mechanical stresses, twisting or misalignment being exerted by clamps, supports, or cabling.

Inspect circuit breaker operating mechanisms for malfunctioning and, where necessary, adjust units for free mechanical movement.

TESTING

Prior to energization of overcurrent protective devices, test devices for continuity of circuitry and for short circuits. Correct malfunctioning units, and then demonstrate compliance with requirements.

END OF SECTION

SECTION 31 20 00 - EARTH MOVING**PART 1 - GENERAL****SUMMARY****Section Includes:**

Preparing subgrades
Excavating and backfilling for buildings and structures.
Base course for concrete walks.
Excavating and backfilling for utility trenches.
Drain media for septic absorption trenches.

SUBMITTALS**Product Data.****Aggregate Sieve Analysis.****DEFINITIONS**

Backfill: Soil material used to fill an excavation.

Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.

Final Backfill: Backfill placed over initial backfill to fill a trench.

Base Course: Course placed between the subbase course, or subgrade, and concrete, or hot-mix asphalt paving.

Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.

Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

Drain media: Course around drainfield piping to maximize infiltration.

Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

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.

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.

Fill: Soil materials used to raise existing grades.

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.

Subgrade: Surface or elevation remaining after completing excavation, or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

Unified Soil Classification System:

- GW: Well-graded gravels; gravel/sand mixtures with little or no fines.
- GP: Poorly-graded gravels; gravel/sand mixtures with little or no fines.
- GM: Silty gravels; poorly-graded gravel/sand/silt mixtures.
- GC: Clayey gravels; poorly-graded gravel/sand/clay mixtures.
- SW: Well-graded sands' gravelly sands with little or no fines.
- SP: Poorly-graded sands; gravelly sands with little or no fines.
- SM: Silty sands; poorly, graded- sand/gravel/silt mixtures.
- SC: Clayey sands; poorly-graded sand/gravel/clay mixtures.
- ML: Inorganic silts; sandy, gravelly, or clayey silts.
- CL: Lean clays; inorganic, gravelly, sandy, or silty, low to medium-plasticity clays.
- OL: Organic, low-plasticity clays and silts.
- MH: Inorganic, elastic silts; sandy, gravelly or clayey elastic silts
- CH: Fat clays; high-plasticity, inorganic clays.
- OH: Organic, medium to high-plasticity clays and silts
- PT: Peat, humus, hydric soils with high organic content.

PROJECT CONDITIONS

Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.

Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

Site Information: Research public utility records and verify existing utility locations prior to ordering any material. Notify the Architect immediately if any discrepancies are found in the project survey.

PART 2 - PRODUCTS

SOIL MATERIALS

General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

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 in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

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.

Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

Base Course: Use Oregon Standard Specifications for Construction 3/4-inch-0" BASE AGGREGATE.

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 3-inch sieve and not more than 12 percent passing a No. 200 sieve.

Bedding Course: Use Oregon Standard Specifications for Construction 3/4"-0" BASE AGGREGATE.

Drain Media: 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.

Backfill and Fill:

Satisfactory soil materials

Initial trench backfill: Use Oregon Standard Specifications for Construction 3/4"-0" BASE AGGREGATE.

ACCESSORIES

Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored to comply with local practice or requirements of authorities having jurisdiction or as follows:

Red: Electric.

Yellow: Gas, oil, steam, and dangerous materials.

Orange: Telephone and other communications.

Blue: Water systems.

Green: Sewer systems.

Tracer Wire: 12 AWG minimum solid copper insulated High Molecular Weight Polyethylene (HMW PE) tracer wire or approved equal. The tracer wire insulation shall be green for sewer pipe and blue for water-lines and be a minimum of 45 mil thick. Joints or splices shall be waterproof. The wire shall be rated for 30 Volt.

Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

Grab Tensile Strength: 110 lbf; ASTM D 4632.

Tear Strength: 40 lbf; ASTM D 4533.

Puncture Strength: 220 lbf; ASTM D 4833.

Apparent Opening Size: No. 40; ASTM D 4751.

Permativity (minimum): .5 sec-1; ASTM D 4491.

Separation Fabric: Woven geotextile, specifically manufactured as a separation geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

Grab Tensile Strength: 180 lbf; ASTM D 4632.

Tear Strength: 68 lbf; ASTM D 4533.

Puncture Strength: 371 lbf; ASTM D 4833.

Apparent opening size: No. 30; ASTM D 4751.

PART 3 - EXECUTION**PREPARATION**

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. Provide protective insulating materials as necessary.

Protect and maintain erosion and sedimentation controls during earth moving operations.

Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

EXPLOSIVES

Explosives: Do not use explosives.

EXCAVATION

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 without prior approval by the Architect.

If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

EXCAVATION FOR STRUCTURES

Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

EXCAVATION FOR WALKS AND PAVEMENTS

Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

EXCAVATION FOR UTILITY TRENCHES

Excavate trenches to indicated gradients, lines, depths, and elevations.

Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

Clearance: 6 inches each side of pipe or conduit.

Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade and bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material, 4 inches deeper elsewhere, to allow for bedding course. Hand excavate for bell of pipes.

Excavate utility structures to provide 6 inches of clearance (enlarge as needed) to allow for compaction of backfill material.

SUBGRADE INSPECTION

Proof-roll subgrade with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. Do not proof-roll subgrade in infiltration facilities.

Soft pockets and areas of excess yielding that have been identified shall be scarified and moistened or aerated, or removed and replaced with suitable soil materials to the depth required. Recompact and retest until specified compaction is obtained.

Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

UNAUTHORIZED EXCAVATION

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.

Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

STORAGE OF SOIL MATERIALS

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.

Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

BACKFILLS AND FILLS

Backfill: Place and compact backfill in excavations promptly, but not before completing the following:

Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.

Surveying locations of underground utilities for record documents.

Inspecting and testing underground utilities.

Removing concrete formwork.

Removing trash and debris.

Removing temporary shoring and bracing, and sheeting.

Installing permanent or temporary horizontal bracing on horizontally supported walls.

UTILITY TRENCH BEDDING

Place bedding on subgrades free of mud, frost, snow, or ice.

Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

UTILITY TRENCH BACKFILL

Trenches under Footings: Backfill trenches excavated under footings with satisfactory soil or approved backfill to within 18 inches from the bottom of footings elevation; fill remaining trench excavation with concrete up to the elevation of bottom of footings. Concrete is specified in "Cast-in-Place Concrete."

Place and compact initial trench backfill material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

Place and compact final backfill of satisfactory soil to final subgrade elevation.

Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

Install tracer wire in a continuous fashion above the utility in such a manner as to be able to properly trace utility lines without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire. Bring tracer wire to the surface at every box, vault, drainage structure, or manhole.

DRAIN MEDIA

Compaction of the native soil subgrade should be limited in order to prevent a reduction in the permeability of the soil.

Where erosion of subgrade has caused accumulation of fine materials and/or surface ponding, this material shall be removed with light equipment and underlying soils scarified to a minimum depth of 3 inches with a York rake or equivalent and light tractor.

Where subgrade has been compacted due to construction traffic, subgrade shall be scarified or removed to a depth sufficient to match the naturally occurring insitu state. Add additional base course material to meet design grades at no cost to the owner.

Bring subgrade of base course to line, grade, and elevations indicated. Fill and lightly re-grade any areas damaged by erosion, ponding, or traffic compaction before the placing of stone.

SOIL FILL

Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

Place and compact fill material in layers to required elevations as follows:

- Under grass and planted areas, use satisfactory soil material.
- Under walks and pavements, base course.
- Under steps and ramps, base course.
- Under and around utility structures, use engineered fill.

SOIL MOISTURE CONTROL

Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.

Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

COMPACTION OF SOIL BACKFILLS AND FILLS

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.

Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.

Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.

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.

For utility trenches, compact each layer of initial and final backfill soil material at 95 percent.

GRADING

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.

Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

Turf or Unpaved Areas: Plus or minus 1 inch.

Walks: Plus or minus 1/2 inch.

Pavements: Plus or minus 1/2 inch.

BASE COURSES UNDER PAVEMENTS AND WALKS

Place base course on subgrades free of mud, frost, snow, or ice.

On prepared subgrade, place base course under pavements and walks as follows:

Shape base course to required crown elevations and cross-slope grades.

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.

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 698.

FIELD QUALITY CONTROL

Testing Agency: Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

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.

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.

Testing Agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

Paved and building slab areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet or less of wall length, but no fewer than two tests.

Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two tests.

With the approval of the Engineer, proof-roll testing of subgrade and/or aggregate base may be substituted for other compaction testing.

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.

PROTECTION

Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

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.

Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

Weather permitting and as approved, stormwater infiltration facility plants shall be installed as soon as possible after placing and grading the growing media in order to minimize erosion and further compaction.

DISPOSAL OF SURPLUS AND WASTE MATERIALS

Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

SECTION 32 13 13 - CONCRETE PAVING

PART 1 - GENERAL

SUMMARY

Section Includes:

- Driveways
- Roadways
- Parking lots
- Curbs and gutters
- Sidewalks

SUBMITTALS

Product Data: For each type of product indicated.

Samples: For each exposed product and for each color and texture specified.

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.

Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:

- Cementitious materials
- Admixtures
- Curing compounds
- Applied finish materials
- Bonding agent or epoxy adhesive
- Joint fillers

Minutes of pre-installation conference

QUALITY ASSURANCE

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.

Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.

ACI Publications: Comply with ACI 301 unless otherwise indicated.

Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

Before submitting design mixtures, review concrete pavement mixture design and examine procedures for ensuring quality of concrete materials and concrete pavement construction practices. Require representatives, including the following, of each entity directly concerned with concrete pavement, to attend conference:

- Contractor's superintendent
- Independent testing agency responsible for concrete design mixtures
- Ready-mix concrete producer
- Concrete pavement subcontractor

PROJECT CONDITIONS

Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

FORMS

Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

Use flexible or curved forms for curves with a radius 100 feet or less.

Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

CONCRETE MATERIALS

Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:

Portland Cement: ASTM C 150, gray portland cement Type I or Type II

Fly Ash: ASTM C 618, Class C.

Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

Normal-Weight Aggregates: ASTM C 33, Class 4S, uniformly graded. Provide aggregates from a single source.

Maximum Coarse-Aggregate Size: 1 inch nominal.

Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

Water: Potable and complying with ASTM C 94/C 94M.

Air-Entraining Admixture: ASTM C 260.

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.

Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

CURING MATERIALS

Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry or cotton mats.

Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

Water: Potable.

Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B, dissipating.

RELATED MATERIALS

Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to requirements.

PAVEMENT MARKINGS

Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with FS TT-P-115, Type I or AASHTO M 248, Type N.

Color: Match Existing.

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 45 minutes.

Color: Match Existing.

Pavement-Marking Paint: MPI #97 Latex Traffic Marking Paint.

Color: Match Existing.

CONCRETE MIXTURES

Prepare design mixtures, proportioned according to ACI 301, with the following properties:

Compressive Strength (28 Days): 3500 psi.

Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50.

Slump Limit: 4 inches, plus or minus 1 inch.

Air Content: 5-1/2 percent plus or minus 1.5 percent for 1-inch nominal maximum aggregate size.

Use a qualified testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.

Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

CONCRETE MIXING

Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M. Furnish batch certificates for each batch discharged and used in the Work.

When temperature is between 85 deg F and 90 deg F , reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F , reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION**EXAMINATION AND PREPARATION**

Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading and elevation tolerances.

Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph.

Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons.

Subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch require correction according to requirements in Division 31 Section "Earth Moving."

Remove loose material from compacted subbase surface immediately before placing concrete.

Proceed with concrete pavement operations only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

EDGE FORMS AND SCREED CONSTRUCTION

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.

After the forms have been set to correct grade, the grade shall be thoroughly tamped, either mechanically or by hand, at both the inside and outside edges of the base of the forms. Forms shall be staked into place with no less than 3 pins for each 10-foot section. A pin shall be placed at each side of every joint.

Form sections shall be tightly locked and shall be free from play or movement in any direction. The forms shall not deviate from true line by more than 1/4 inch at any joint. Forms shall be so set that they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment.

The alignment and grade elevations of the forms shall be checked and corrections made by the Contractor immediately before placing the concrete. When any form has been disturbed or any grade has become unstable, the form shall be reset and rechecked.

Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

JOINTS

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.

When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

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. If sufficient concrete is not available to finish the current panel, the Contractor shall remove the fresh concrete back to the nearest transverse joint.

Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.

Provide tie bars at sides of pavement strips where indicated.

Butt Joints: Use epoxy bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.

Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint or install plastic dowel sleeves per manufacturer's recommendations.

Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

Locate isolation joints at intervals of 50 feet, unless otherwise indicated.

Extend joint fillers full width and depth of joint.

Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.

Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.

Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.

Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary pre-formed cap. Remove protective cap after concrete has been placed on both sides of joint.

Longitudinal Joints: A longitudinal joint shall be considered a joint parallel with the long dimension of the paving area.

Construction: Longitudinal construction joints necessary for lane construction shall be formed against suitable side forms (usually made of steel) with or without keyways, as indicated in the Drawings. Wooden forms may be used under special conditions, when approved by the Engineer. When the concrete is placed using slip-form pavers, the keyway shall be formed in the plastic concrete by means of preformed metal keyway liners which are inserted during the slip-form operations to form the female side of the key and which may be left in place. The dimensions of the keyway forms shall not vary more than plus or minus 1/4 inch from the dimensions indicated and shall not deviate more than plus or minus 1/4 inch from the mid-depth of the pavement. A male keyway may be used provid-

ing the keyway and edge tolerances are met. Where butt-type joints with dowels are designated, the dowels for this type shall be painted and greased. The edges of the joint shall be finished with a grooving tool or edging tool, and a space or slot shall be formed along the joint of the dimensions, as indicated, to receive the joint sealing material. Longitudinal construction joints shall be sawed to provide a groove at the top conforming to the details and dimensions indicated on the Drawings. Provisions shall be made for the installation of tie bars as noted on the Drawings.

Contraction or Weakened-Plane Type: the longitudinal groove formed or sawed in the top of the slab shall be installed where indicated on the Drawings. The groove shall be formed in the plastic concrete with suitable tools or material to obtain the width and depth specified, or it shall be sawed with approved equipment in the hardened concrete to the dimensions required. When the groove is formed in plastic concrete, it shall be true to line with not more than 1/4 inch variation in 10 feet; it shall be uniform in width and depth; and the sides of the groove shall be finished even and smooth with an edging tool. If an insert material is used, the installation and edge finish shall be according to the manufacturer's instructions. The sawed groove shall be straight and of uniform width and depth. In either case, the groove shall be clean cut so that spalling will be avoided at intersections with transverse joints. Tie bars shall be installed across these joints where indicated on the Drawings.

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:

Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate grooved marks on concrete surfaces.

Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete once concrete has hardened sufficiently such that the cutting action will not tear, abrade, or otherwise damage the surface and before developing random contraction cracks. The sawing of any joints shall be discontinued or omitted if a crack occurs at or near the joint location before or during sawing. Concrete panels that have started cracking before or during the saw cutting of the joints shall be removed and replaced at no expense to the Owner.

Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

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.

CONCRETE PLACEMENT

Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

Comply with ACI 301 requirements for measuring, mixing, transporting, placing, and consolidating concrete.

Do not add water to concrete during delivery or at Project site.

Do not add water to fresh concrete after testing.

Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.

Remove and replace concrete that has been placed for more than 15 minutes without being covered by top layer, or use bonding agent if approved by Architect.

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.

Screed paving surface with a straightedge and strike off.

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.

Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.

Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.

Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.

When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.

Do not use frozen materials or materials containing ice or snow.

Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water

equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

FLOAT FINISHING

General: Do not add water to concrete surfaces during finishing operations.

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.

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.

Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a ¼ inch (6mm) radius. Repeat tooling of edges after applying surface finished. Eliminate tool marks on concrete surfaces.

CONCRETE PROTECTION AND CURING

General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

Comply with ACI 306.1 for cold-weather protection.

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.

Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows.

Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

Water

Continuous water-fog spray

Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

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, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

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.

PAVING TOLERANCES

Comply with tolerances in ACI 117 and as follows:

Elevation: 1/4 inch.

Thickness: Plus 3/8 inch, minus 1/4 inch.

Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch.

Joint Spacing: 1/2 inch .

Contraction Joint Depth: Plus 1/4 inch, no minus.

Joint Width: Plus 1/8 inch, no minus.

Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.

Vertical Alignment of Tie Bars and Dowels: 1/4 inch.

Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.

Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.

PAVEMENT MARKING

Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.

Allow concrete pavement to cure for 28 days and be dry before starting pavement marking.

Sweep and clean surface to eliminate loose material and dust.

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.

Spread glass beads uniformly into wet pavement markings at a rate of 6 lb/gal..

FIELD QUALITY CONTROL

Testing Agency: Engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

Testing Frequency: Obtain at least 1 composite sample for each 100 cu. yd or fraction thereof of each concrete mix placed each day.

When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.

Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.

Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.

Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.

Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.

A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.

Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.

Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

REPAIRS AND PROTECTION

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.

Drill test cores, where directed by Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

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.

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.

PART 1 - GENERAL**SUMMARY**

Section Includes: Gravity-flow, nonpressure and force-main, pressure sanitary sewerage outside the building, with the following components:

- Pipe and fittings.
- Nonpressure and pressure couplings.

PERFORMANCE REQUIREMENTS

Gravity-Flow, Nonpressure, Drainage-Piping Pressure Rating: 10-foot head of water.

Force-main, pressure-piping rating: at least equal to system operating pressure but not less than 50 psig.

SUBMITTALS

Product Data: For the following:

- Pipe material.
- Mechanical plugs.

Shop Drawings: For pump. Include plans, elevations, sections, details, float settings, and frames and covers.

Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewer system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.

Field quality-control reports.

PROJECT CONDITIONS

Site information: Research public utility records and verify existing utility locations prior to ordering any materials. Notify the Architect immediately if any discrepancies are found in the project survey.

PART 2 - PRODUCTS**MANUFACTURERS**

In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

Available manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

PIPING MATERIALS

Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.

PVC PIPE AND FITTINGS**PVC Type PSM Sewer Piping:**

Pipe: ASTM D 3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for solvent-cemented or gasketed joints.

Fittings: ASTM D 3034, PVC with bell ends.

Gaskets: ASTM F 477, elastomeric seals.

PVC Pressure Pipe and Fittings: ASTM E 1785 Schedule 80 pipe, with plain ends for solvent-cement joints with ASTM D 2467, Schedule 80 socket-type fittings.

NONPRESSURE-TYPE TRANSITION COUPLINGS

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.

Sleeve Materials:

For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.

For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

Unshielded, Flexible Couplings:

Description: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.

Ring-Type, Flexible Couplings: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

PRESSURE-TYPE PIPE COUPLINGS

Tubular-Sleeve Couplings: AWWA C219, with center sleeve, gaskets, end rings, and bolt fasteners.

Metal, bolted, sleeve-type, reducing or transition coupling, for joining underground pressure piping. Include 150-psig minimum pressure rating and ends of same sizes as piping to be joined.

Center-Sleeve Material: Manufacturer's standard.

Gasket Material: Natural or synthetic rubber.

Metal Component Finish: Corrosion-resistant coating or material.

PUMP BASINS

PVC Pump Basin by Orenco, 30-inch diameter.

Frames and Covers:

Install standard manhole frame & cover over riser. Frame and cover to be vehicle rated.

Description: Ferrous; 23-inch ID by 3- to 7-inch riser, with 3 ¼ -inch-minimum-width flange and 24 ¾ -inch- diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "SANITARY SEWER."

Material: ASTM A 536, Grade 60-40-18 ductile or ASTM A 48/A 48M, Class 35 gray iron designed for heavy duty service unless otherwise indicated.

CONCRETE

General: Cast-in-place concrete complying with ACI 318, ACI 350/350R, and the following:

Cement: ASTM C 150, Type II.

Fine Aggregate: ASTM C 33, sand.

Coarse Aggregate: ASTM C 33, crushed gravel.

Water: Potable.

Portland Cement Design Mix: 3000 psi minimum, with 0.45 maximum water/cementitious materials ratio.

Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.

Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 3000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.

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.

Invert Slope: Uniform slope through manhole to match invert elevations per plans, minimum 2 percent.

Benches: Concrete, sloped to drain into channel.

Slope: 8 percent.

Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.

Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.

Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

PUMP

Oreco duplex pumps with control panel, per specifications and manufacturer.

PART 3 - EXECUTION

EARTHWORK

Excavating, trenching, and backfilling are specified in Section 31 20 00 "Earth Moving."

PIPING APPLICATIONS

Pipe couplings and fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.

Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping, unless otherwise indicated.

Shielded flexible couplings for same or minor difference OD pipes.

Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.

Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

Gravity-flow, Nonpressure Sewer Piping: Use any of the following pipe materials for each size range.

NPS 4 to NPS 15: PVC 3034 sewer pipe and fittings gaskets, and gasketed joints.

Force-main Pressure Piping: use the following pipe materials for each size range:

NPS 1 to NPS 3: PVC Schedule 80, service pipe; PVC Schedule 80, service-pipe fittings; and solvent-cemented joints.

PIPING INSTALLATION

Install tracer wire directly over piping and at outside edges of underground structures. See Section 31 20 00 "Earth Moving" for tracer wire material requirements.

General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewer 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.

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 using lubricants, cements, and other installation requirements.

Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

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.

Install gravity-flow, nonpressure, sewer piping according to the following:

Install piping pitched down in direction of flow, at minimum slope of 2 percent unless otherwise indicated.

Install piping with 36-inch minimum cover.

Install PVC Type PSM sewer piping according to ASTM D 2321 and ASTM F 1668.

Install force-main, pressure piping according to the following:

Install piping with restrained joints at tee fittings and at horizontal and vertical changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place-concrete supports or anchors.

Install piping with 24-inch minimum cover.

Install PVC pressure piping according to AWWA M23 or to ASTM D 2774 and ASTM F 1668.

Install PVC service piping according to ASTM D 2774 and ASTM F 1668.

Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

Install backwater valves in piping where indicated.

PIPE JOINT CONSTRUCTION

Basic piping joint construction is specified in Section 33 05 00 "Common Work Results for Utilities." Where specific joint construction is not indicated, follow piping manufacturer's written instructions.

Join gravity-flow, nonpressure, drainage piping according to the following:

- Join PVC corrugated sewer piping according to ASTM D 2321.
- Join PVC Type PSM sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.
- Join dissimilar pipe materials with nonpressure-type, flexible [or rigid] couplings.
- Join ductile-iron, gravity sewer piping according to AWWA C600 for push-on joints.

Join force-main, pressure piping according to the following:

- Join ductile-iron pressure piping according to AWWA C600 or AWWA M41 for push-on joints.
- Join ductile-iron special fittings according to AWWA C600 or AWWA M41 for push-on joints.
- Join PVC pressure piping according to AWWA M23 for gasketed joints.
- Join PVC service piping according to ASTM D 2855.
- Join dissimilar pipe materials with pressure-type couplings.

Pipe couplings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

Use nonpressure flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.

Unshielded flexible couplings for pipes of same or slightly different OD.

Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.

Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

PUMP BASIN INSTALLATION

General: Install basins complete with appurtenances and accessories indicated.

Install per manufacturer's recommendations.

Set tops of frames and covers flush with finished surface for manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere unless otherwise indicated.

CONCRETE PLACEMENT

Place cast-in-place concrete according to ACI 318.

CONNECTIONS

Connect nonpressure, gravity-flow drainage piping to building's sanitary building drain. Use transition fitting to join dissimilar piping materials.

Connect force-main piping to building's sanitary force mains specified in Section 221316 "Sanitary Waste and Vent Piping." Terminate piping where indicated.

Make connections to existing piping and underground manholes.

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.

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.

Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes by core drilling into existing unit. Make connection into existing pipe using an "Inserta-Tee" fitting per the manufacturer's recommendations or approved equal. Make connection to existing manhole using round rubber gasket installed on the pipe per the manufacturer's instructions. Cut end of connection pipe passing through the manhole wall to conform to the shape of and be flush with the inside wall unless otherwise indicated. The opening around the gasket shall be grouted to a water-tight seal. Existing manhole inverts, flow lines, channels, etc. shall be chipped out and re-grouted to accommodate the new pipe.

Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.

Use epoxy-bonding compound as interface between new and existing concrete and piping materials.

Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

Make connections to existing piping and underground structures so finished Work complies with requirements specified for new Work.

FIELD QUALITY CONTROL

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.

Submit separate report for each system inspection.

Defects requiring correction include the following:

Alignment: Less than full diameter of inside of pipe is visible between structures.

Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.

Damage: Crushed, broken, cracked, or otherwise damaged piping.

Infiltration: Water leakage into piping.

Exfiltration: Water leakage from or around piping.

Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.

Reinspect and repeat procedure until results are satisfactory.

Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

Do not enclose, cover, or put into service before inspection and approval.

Test completed piping systems according to requirements of authorities having jurisdiction.

Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

Submit separate report for each test.

Retain one of first two subparagraphs below for tests.

Hydrostatic Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction and the following:

Fill sewer piping with water. Test with pressure of at least 10-foot head of water, and maintain such pressure without leakage for at least 15 minutes.

Allowable leakage is maximum of 50 gal. /inch of nominal pipe size per mile of pipe, during 24-hour period.

Close openings in system and fill with water.

Purge air and refill with water.

Disconnect water supply.

Test and inspect joints for leaks.

Option: Test concrete gravity sewer piping according to ASTM C 924.

Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

Option: Test plastic gravity sewer piping according to ASTM F 1417.

Force Main: Perform hydrostatic test after thrust blocks, supports, and anchors have hardened. Test at pressure not less than 1-1/2 times the maximum system operating pressure, but not less than 150 psig.

PVC Piping: Test according to AWWA M23, "Testing and Maintenance" Chapter.

Leaks and loss in test pressure constitute defects that must be repaired.

Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

CLEANING

Clean dirt and superfluous material from interior of piping.

PART 1 - GENERAL**SUMMARY**

Section Includes gravity-flow nonpressure storm drainage outside the building, with the following components:

Pipe and fittings.
Trench Drains.

SUBMITTALS

Product Data: For each type of product indicated.

Backwater valves
Pipe
Fittings
Drains
Trench Drains

Field quality-control reports.

PROJECT CONDITIONS

Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

Notify Architect no fewer than two days in advance of proposed interruption of service.
Do not proceed with interruption of service without Owner's written permission.

Site Information: Research public utility records, and verify existing utility locations prior to ordering any materials. Notify Architect immediately if any discrepancies are found in the project Survey.

PART 2 - PRODUCTS

Refer to Part 3 "Piping Applications" for applications of pipe, fitting, and joining materials.

PE PIPE AND FITTINGS

Corrugated PE Drainage Pipe and Fittings NPS 3 to NPS 10 (DN 80 to DN 250): AASHTO M 252M, Type S, with smooth waterway for coupling joints.

Soiltight Couplings: AASHTO M 252M, corrugated, matching tube and fittings.

PVC PIPE AND FITTINGS

PVC Sewer Pipe and Fittings, NPS 15 and Smaller: ASTM D 3034, SDR 35 with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.

NONPRESSURE TRANSITION COUPLINGS

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.

Sleeve Materials:

For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.

For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

Unshielded, Flexible Couplings:

Description: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.

Shielded, Flexible Couplings:

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.

Ring-Type, Flexible Couplings:

Description: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

POLYMER-CONCRETE TRENCH DRAINS

General Requirements for Polymer-Concrete, Channel Drainage Systems: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include quantity of units required to form total lengths indicated.

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

[ACO USA.](#)

[Poly-Cast.](#)

Zurn.

Approved equal.

Polymer-Concrete Systems:

Channel Sections:

Interlocking-joint, precast, modular units with end caps.

4-inch inside width and deep, rounded bottom, and with outlets in quantities, sizes, and locations indicated.

Extension sections necessary for required depth.

Frame: Include ductile iron or steel frame for grate.

Grates:

Manufacturer's designation "Medium Duty," with slots or perforations that fit recesses in channels.

Material: Ductile iron.

Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.

Invert: Sloped with built-in invert slope per manufacturer.

PART 3 - EXECUTION

EARTHWORK

Excavation, trenching, and backfilling are specified in Section 31 20 00 "Earth Moving." Install tracer wire directly over piping and at outside edges of underground structures. See section 31 20 00 "Earth Moving" for tracer wire material requirements.

PIPING INSTALLATION

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.

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.

Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.

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.

When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process or microtunneling.

Install gravity-flow, nonpressure drainage piping according to the following:

Install piping pitched down in direction of flow at a minimum slope of 1 percent, unless otherwise indicated.

Install piping with 36-inch minimum cover, unless otherwise indicated.

Install PE corrugated sewer piping according to ASTM D 2321.

Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

Install corrosion-protection piping encasement over the following underground metal piping according to ASTM A 674 or AWWA C105:

Ductile-iron pipe and fittings.

Clear interior of piping and manholes of dirt and superfluous material as work progresses.

PIPE JOINT CONSTRUCTION

Basic pipe joint construction is specified in Division 33 Section "Common Work Results for Utilities." Where specific joint construction is not indicated, follow piping manufacturer's written instructions.

Join gravity-flow, nonpressure drainage piping according to the following:

Join ductile-iron culvert piping according to AWWA C600 for push-on joints.

Join ductile-iron piping and special fittings according to AWWA C600 or AWWA M41.

Join corrugated PE piping according to ASTM D 3212 for push-on joints.

Join PVC corrugated sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints.

Join nonreinforced-concrete sewer piping according to ASTM C 14 and ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.

Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.

Join dissimilar pipe materials with nonpressure-type flexible couplings.

CONNECTIONS

Connect nonpressure, gravity-flow drainage piping in building's storm building drains specified in Section 22 14 13 "Facility Storm Drainage Piping."

Make connections to existing piping and underground manholes.

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.

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.

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.

Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.

Use epoxy-bonding compound as interface between new and existing concrete and piping materials.

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.

Pipe couplings and expansion joints with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.

Use nonpressure-type flexible couplings where required to join gravity-flow, nonpressure sewer piping unless otherwise indicated.

Shielded flexible couplings for same or minor difference OD pipes.

Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.

Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

IDENTIFICATION

Install green tracer wire directly over piping and at outside edges of underground structure. See Section 31 20 00 "Earth Moving" for tracer wire material requirements.

FIELD QUALITY CONTROL

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.

Submit separate reports for each system inspection.

Defects requiring correction include the following:

Alignment: Less than full diameter of inside of pipe is visible between structures.

Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.

Damage: Crushed, broken, cracked, or otherwise damaged piping.

Infiltration: Water leakage into piping.

Exfiltration: Water leakage from or around piping.

Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.

Reinspect and repeat procedure until results are satisfactory.

Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

Do not enclose, cover, or put into service before inspection and approval.

Test completed piping systems according to requirements of authorities having jurisdiction.

Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

Submit separate report for each test.

Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

Option: Test plastic piping according to ASTM F 1417.

Option: Test concrete piping according to ASTM C 924.

Leaks and loss in test pressure constitute defects that must be repaired.

Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.