



**PROJECT MANUAL:
BID REQUEST / BID DOCUMENTS**

***Coburg Operations Building and
Operations Storage Building Project
June 2nd, 2023***

Specifications & Proposal Package



**City of Coburg
91136 N. Willamette Street
Coburg, Oregon 97408**

Bid Opening: June 28th, 2023, 2:00 p.m.

CERTIFICATIONS PAGE

Professional of Record Certification(s):

<p>Stamp</p>  <p>EXPIRES: 12/31/24</p>	<p>I certify the Sections listed below were prepared under my supervision:</p> <p>CSI Sections: 311000, 312000, 312316, 321216, 321313, 321723, 331415</p> <p>City Standard Section: 900 (partial)</p> <p>I certify the Sections listed below were formatted under my supervision, under direction of Owner:</p> <p>City Standard Section: 000, 100, 200, 300, 400, 500, 600</p>
<p>Signature</p> 	<p>Civil Design Engineer Branch Engineering, Inc. 310 5th Street, Springfield, OR 97477 P: 541-746-0637</p>

<p>Stamp</p>  <p>Renews: JUNE 30, 2023</p>	<p>I certify the Sections listed below were prepared under my supervision:</p> <p>CSI Sections: 030130, 032000, 055000, 055119, 055213, 061000, 061600, 061715, 072100, 081113, 083613, 087100, 088000, 092900, 093013, 099113, 099123, 102800, 113013, 123213, 123216, 123623.13, 133419, 200000, 220300, 230000, 260000, 265000, 311000, 312000</p> <p>City Standard Section: 900 (partial)</p>
<p>Signature</p> 	<p>Structural Design Engineer Branch Engineering, Inc. 310 5th Street, Springfield, OR 97477 P: 541-746-0637</p>

CITY OF COBURG, OREGON

TABLE OF CONTENTS

SECTION 000 THE INVITATION

- Invitation to Bid
- Scope of Work

SECTION 100 BID INSTRUCTIONS/INFORMATION

- Instructions to Bidders
- Document Holder Information

SECTION 200 BID PACKAGE DOCUMENTS

- Schedule of Bid Items/Contract Proposal
- Bid Bond
- Addenda Certifications
- Contract Certifications
- Oregon Statutory (ORS) Certifications
- First-Tier Subcontractor Disclosure Form
- Project Reference Form

SECTION 300 SAMPLE CONTRACT – TERMS & CONDITIONS APPLICABLE TO PROJECT

- Sample Contract

SECTION 400 GENERAL CONDITIONS

- General Conditions
- Supplementary General Conditions

SECTION 500 STANDARD SPECIFICATIONS

- Standard Specifications

SECTION 600 SPECIAL SPECIFICATIONS

- Special Specifications

SECTION 700 CSI SPECIFICATIONS

DIVISION 03 - CONCRETE

03 01 30	MAINTENANCE OF CAST-IN-PLACE CONCRETE
03 20 00	CONCRETE REINFORCING
03 30 00	CAST-IN-PLACE CONCRETE

DIVISION 05 - METALS

05 50 00	METAL FABRICATIONS
05 51 19	METAL GRATING STAIRS
05 52 13	PIPE AND TUBE RAILINGS

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 10 00	ROUGH CARPENTRY
06 16 00	SHEATHING
06 17 15	ENGINEERED STRUCTURAL WOOD

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 21 00	THERMAL INSULATION
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DIVISION 08 - OPENINGS

08 11 13	HOLLOW METAL DOORS AND FRAMES
08 36 13	SECTIONAL DOORS
08 71 00	DOOR HARDWARE
08 80 00	GLAZING
DIVISION 09 - FINISHES	
09 29 00	GYPSUM BOARD
09 30 13	CERAMIC TILING
09 91 13	EXTERIOR PAINTING
09 91 23	INTERIOR PAINTING
DIVISION 10 - SPECIALTIES	
10 28 00	TOILET, BATH, AND LAUNDRY ACCESSORIES
DIVISION 11 - EQUIPMENT	
11 30 13	RESIDENTIAL APPLIANCES
DIVISION 12 - FURNISHINGS	
12 32 16	MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK
12 36 23.13	PLASTIC-LAMINATE-CLAD COUNTERTOPS
DIVISION 13 - SPECIAL CONSTRUCTION	
13 34 19	METAL BUILDING SYSTEMS
DIVISION 22 - PLUMBING	
22 00 00	GENERAL PLUMBING PROVISIONS
22 03 00	PLUMBING SYSTEMS
22 13 19.13	SANITARY DRAINS
DIVISION 23 - MECHANICAL	
23 00 00	HEATING, VENTILATION, AND AIR CONDITIONING PROVISIONS
DIVISION 26 - ELECTRICAL	
26 00 00	ELECTRICAL PROVISIONS
26 50 00	LIGHTING
DIVISION 31 - EARTHWORK	
31 10 00	SITE CLEARING
31 20 00	EARTH MOVING
DIVISION 32 - EXTERIOR IMPROVEMENTS	
32 12 16	ASPHALT PAVING
32 13 13	CONCRETE PAVING
32 17 23	PAVEMENT MARKINGS
DIVISION 33 - UTILITIES	
33 14 15	SITE WATER DISTRIBUTION PIPING
33 42 00	STORMWATER CONVEYANCE

SECTION 800 PERMIT INFORMATION

- Building Permit Requirements

SECTION 900 DRAWINGS

- Construction Drawings

SECTION 000 - THE INVITATION

- **010 - INVITATION TO BID – ADVERTISEMENT**
- **020 - SCOPE OF WORK**

SECTION 010

CITY OF COBURG INVITATION FOR BIDS

NOTICE IS HEREBY GIVEN THAT Sealed bids for Coburg Operations Building and Operations Storage Building Project, City of Coburg, Oregon, shall be addressed to the City Engineer, Julie Leland, P.E., 310 5th Street, Springfield, Oregon 97477 and will be received at Branch Engineering, Inc., 310 5th Street, Springfield, Oregon 97477. Acceptance of bids will be officially closed at **2:00 pm Pacific Time, Wednesday, June 28th, 2023**, and immediately thereafter the bids will be publicly opened and read at Branch Engineering. The bid proposal shall be submitted under sealed cover and marked with the Contractor's name and project name.

The project involves construction of a new operations building and a separate storage building at the wastewater treatment plant at 91611 N Coburg Road, Coburg, Lane County, Oregon. The work involves site preparation, excavation, removal, and compaction for the building pad and foundation for both buildings, utility connections to the buildings, concrete paving, gravel and asphalt paving, concrete valley gutter installation, and French drain installation. The Engineer's Estimate for this Project is approximately \$900,000-\$950,000.

All proposals must be submitted on the regular forms furnished. The award will be made to the lowest qualified bidder who will be asked to furnish a 100% Corporate Surety Performance Bond for the faithful performance of the contract. The Project Manual including; Plans, Specifications, Agreement, and Bid Forms are available at the City of Coburg's website <http://www.coburgoregon.org> where they can be viewed and printed. Contractors may obtain a paper copy of the Project Manual, including full size Plans, with two business days' notice starting after **June 6th, 2023**, purchased at cost, at Branch Engineering, Inc., 310 Fifth Street, Springfield, Oregon, 97477. Any Addenda will also be posted on the city's website <http://www.coburgoregon.org>. All prospective bidders must be added to the Plan Holders List by sending an e-mail with company contact information to jessicam@branchengineering.com with the project title in the subject line. **Prospective bidders must be on the Plan Holders List for their bid to be considered. Bidders are responsible for checking the website for addenda and changes prior to submitting bid, however notification of Addenda issuance will be issued via e-mail to the addresses listed on the Plan Holders List.** Bid results will be posted on the city's website when available.

Questions, clarifications, proposals for specification changes or requests to approve an alternate product shall be received in writing a minimum of ten days prior to bid receipt date. Send questions or requests via email to Julie Leland, P.E., at juliel@branchengineering.com.

Qualifications: Bidders must be an established business (minimum three years) doing like projects. No bid for a construction contract shall be received or considered by the City of Coburg unless the bidder is Licensed with the Construction Contractors Board and/or by the State Landscape Contractors Board as required by ORS 671.530 and has a current Public Works Bond of \$30,000.00 prior to starting Work on the Project.

This Project is for public improvement and therefore subject to ORS 279C.800 thru 279C.870 Oregon State prevailing wage requirements. No bid will be received or considered by the City of Coburg unless the bid is signed on the City of Coburg format that includes/contains a statement by the bidder that the provisions of ORS 279C.840 are to be complied with.

If this project is over \$100,000, a subcontractor listing is required and can be submitted with the bid. If the subcontractor listing is not submitted with the bid, it must be received within two (2) hours after the bid closing time and date at the City of Coburg, City Hall, 91136 N. Willamette Street, Coburg, OR 97408 to the attention of City Recorder, facsimile is acceptable at 541-682-7850. Failure to supply a correct subcontractor listing may result in bid rejection.

Questions, clarifications, proposals for specification changes or requests to approve an alternate product shall be received in writing a minimum of ten (10) days prior to the bid receipt date. Protests of bid results

must be in writing from a bidder in legal standing, and must be made within five (5) days of the posted award date in accordance with OAR Title 137, Division 49.

The City may reject any bid not in compliance with all prescribed public bidding procedures and requirements, and may, for good cause, reject all bids upon a finding by the City of Coburg if it is in the public interest to do so in accordance to ORS 279C.395.

Published
Date: June 2, 2023
By Anne Heath, City Administrator

END OF SECTION

**SECTION 020
COBURG OPERATIONS BUILDING AND
OPERATIONS STORAGE BUILDING PROJECT
SCOPE OF WORK**

Requirements of Project:

The project involves construction of a new operations building and separate storage building at the wastewater treatment plant at 91611 N Coburg Road, Coburg, Lane County, Oregon. The work involves: the construction of a new operations building and separate storage building, associated utilities, and asphalt and concrete paving. The Engineer's Estimate for this Project is approximately \$900,000-\$950,000.

Location of Project:

The project is located at the City of Coburg's wastewater treatment plant at 91611 N Coburg Road in Coburg, Lane County, Oregon.

Purpose of Project:

The purpose of the project is to provide the City of Coburg with the space and storage necessary for operations and maintenance of city owned utilities.

Project Engineer:

All questions should be directed to:

Julie Leland, P.E., Branch Engineering 541-746-0637
juliel@branchengineering.com

City Schedule:

Bids Closed / Opened & Read:	2:00 PM, JUNE 28, 2023
310 5TH STREET, SPRINGFIELD, OR 97477	
Projected Award Date:	JULY 12, 2023
Projected Start Date:	JULY 29, 2023
Substantial Completion Date:	MAY 31, 2024
Final Completion Date:	JUNE 28, 2024

SECTION 100

INSTRUCTIONS TO BIDDERS

DOCUMENT HOLDER INFORMATION

Section 100
INSTRUCTIONS TO BIDDERS

1. BID FORMS

These Contract Documents include a complete set of bidding and contract forms that are to be filled out and executed.

2. EXPLANATION TO BIDDERS

Any explanation regarding the meaning or interpretation of contract drawings, specifications or other Contract Documents must be requested in writing, with sufficient allowance of time for receipt of reply before the time of bid opening. Any such explanations or interpretations shall be made in the form of addenda to the documents and shall be furnished to all bidders, who shall submit all addenda with their bids. Oral explanations and interpretations made prior to the bid opening shall not be binding.

3. BIDDERS' UNDERSTANDING

Bidders should visit the work site to ascertain by inspection, pertinent local conditions such as location, character and accessibility of the site, availability of facilities, location and character of existing work within or adjacent thereto, labor conditions, etc. The City of Coburg, hereinafter called City, shall make available to all prospective bidders, previous to the receipt of bids, information that they may have as to subsoil conditions and surface topography at the work site. Such information shall be given, however, as the best factual information available without the assumption of responsibility for its accuracy or for any conclusions that the Contractor might draw therefrom.

**4. BID REQUIREMENTS – DOCUMENTS THAT MUST BE SUBMITTED WITH THE BID PROPOSAL;
And First-Tier Subcontractor Disclosure Form Within Two Hours.**

- Schedule of Bid Items – This must be completed and signed.
- Addenda Certifications – Signed by Contractor with number and date of addenda noted.
- Contract Certification – Signed by Contractor.
- ORS Statutory (ORS) Certifications – Signed by Contractor including CCB Number.
- Project Reference Form – Filled out and signed by Contractor
- Within two (2) hours of the bid closing time and date, the First-Tier Subcontractor Disclosure Form must be submitted if required – See bid package documents.

5. PREPARATION OF BIDS

- Bids shall be submitted as required in the Invitation for Bids. Where more than one schedule is given in the Schedule of Bid Items, the bidder may bid on any combination of schedules. If a bidder does not wish to bid on a schedule, he shall check “No Bid” in the space provided on that schedule.
- Bids shall be submitted on the forms provided or copies thereof, and must be signed by the bidder or his authorized representative. Any corrections to entries made on bid forms should be initialed by the person signing the bid.
- Bidders must quote on all items appearing on the bid forms, unless specific directions in the advertisement, on the bid form, or in the special specification allowing for partial bids. Failure to quote on all items may disqualify the bid. When quotations on all items are not required, bidders shall insert the words “No Bid” where appropriate.
- Alternative bids will not be considered unless specifically called for.
- Telephone Facsimile (FAX) bids will be accepted on the following conditions:
 - The time factor does not allow any other means.
 - The bid is sent to a third party (not the City), sealed and presented to the City.
 - The signature is notarized.
 - The original is mailed to the City as soon as possible.

6. SUBMISSION OF BIDS

Bids must be submitted as directed in the Invitation for Bids.

7. RECEIPT AND OPENING OF BIDS

Bids shall be submitted prior to the time fixed in the Invitation for Bids. Bids received after the time so indicated shall be returned unopened.

8. WITHDRAWAL OF BIDS

Bids may be withdrawn upon written or telegraphic request of the Bidder at any time prior to opening.

9. PRESENCE OF BIDDERS AT OPENING

At the time and place fixed for opening bids, the contents of all bids will be made public for the information of all bidders and other interested parties, who may be present in person or by representative.

10. BIDDERS INTERESTED IN MORE THAN ONE BID

If more than one bid is offered by one party, or by any person or persons representing a party, all such bids shall be rejected. A party who has quoted prices to a bidder is not thereby disqualified from quoting prices to other bidders, or from submitting a direct bid on his own behalf.

11. AWARD OF CONTRACT FOR CONSTRUCTION

- The low bidder(s) will be determined on the basis of the sum of the lowest prices for each appropriate Schedule or as specified in the Contract Document.
- The Contract for Construction shall be awarded to the lowest responsible Bidder(s) as soon as practicable after the bid opening, subject to the reservations of paragraph 12 herein. The City reserves the right to waive any informality in bids at City's discretion.
- The City reserves the right to wait until the protest period (5 days) has elapsed before entering into a written contract. In the event a protest is made, the City will not enter into a written contract until the protest is resolved.
- Notice of Award, announcement of apparent low bidder is not a binding contract. Only a signed written contract will be binding to the City.
- Notwithstanding OAR 137-049-0450, an award protest must be filed with the City within five (5) days of the notice of intent to award.

12. REJECTION OF BIDS

The City reserves the right to reject any and all bids.

13. CONTRACT, BONDS, AND INSURANCE

- The Bidder to whom award is made shall enter into a written Contract for Construction with the City within the time specified in the Contractor's Proposal.
- Performance Bond shall be furnished at the time of signing the Contract for Construction.
- Payment Bond shall be furnished at the time of signing the Contract for Construction.
- The insurance required by this Contract shall be written for not less than any limits of liability specified in the Contract Documents or required by law, whichever is greater.

14. WAGES AND SALARIES: Attention of bidders is particularly called to the requirements concerning the payment of not less than the prevailing wage and salary rates specified in the Contract Documents and the conditions of employment with respect to certain categories and classifications of employees.

15. SUBCONTRACTORS

Bidders are required to disclose information about certain first-tier subcontractors in accordance with ORS 279C.370 – See also Contract bid documents which includes form required.

16. CHANGES TO PLANS, SPECIFICATIONS, OR QUANTITIES BEFORE OPENING BIDS

The City of Coburg reserves the right to issue Addenda making changes or corrections to the Plans, Specifications, or quantities before the opening of the bids.

**SECTION 110
DOCUMENT HOLDER INFORMATION**

Pricing

Pricing will be firm and irrevocable for Sixty (60) days after the bid opening.

Unit Billing

Unit prices for materials/equipment are considered furnished and installed prices. Billing reflecting material only will not be accepted. Invoices/billings will be processed only for those units (or percentages of) that are installed.

Federal Mandate (DOT)

As of January 1, 1996, all Contractors whose employees are required to have a Commercial Driver's License (CDL) must comply with Department of Transportation Controlled Substance and Alcohol Program and testing rules.

Oregon Public Contracting Statutes and Rules

Bids and the Contract are governed by the Oregon Public Contracting Code (ORS Titles 279A, 279B, and 279C as applicable) and Oregon Public Contracting Code Model Rules (OAR Title 137 as applicable). See the Contract Documents for specific requirements and obligations.

Copies of Plans & Specification

Any additional copies of the Contract Documents or Plans to the contractor will be at the Contractor's expense. Additional copies of Contract Documents or Plans may be obtained on request by paying the actual cost of reproducing the Contract Documents or Plans.

Brand Name Specification

Brand name specification: if a brand name is given, it is only intended to define a quality and type desired by the City and is not intended to eliminate any competition or like equipment. The City, however, reserves the right to approve the exceptions taken to the specifications.

**Section 200
BID DOCUMENT PACKAGE**

**Section 210
REQUIRED BID DOCUMENTS**

TO BE CONSIDERED RESPONSIVE, THE FOLLOWING MUST BE PRESENTED TO CITY OF COBURG AT THE SPECIFIED PLACE PRIOR TO THE BID TIME AND DATE – EXCEPT AS NOTED FOR THE FIRST-TIER SUBCONTRACTOR DISCLOSURE:

- **SCHEDULE OF BID ITEMS** – MUST BE COMPLETE – MUST BE SIGNED AND DATED
- **BID BOND** – A SIGNED, SEALED AND DATED BID BOND IN THE AMOUNT OF NO LESS THAN 5% OF THE TOTAL BID PRICE
- **THE ADDENDA CERTIFICATION FORM** – MUST BE SIGNED, DATED AND ALL ADDENDA'S NOTED.
- **THE CONTRACT CERTIFICATION FORM** – MUST BE SIGNED AND DATED
- **THE OREGON STATUTORY (ORS) CERTIFICATION FORM** – MUST BE SIGNED, DATED AND THE CONTRACTOR CCB REGISTER NUMBER SHOWN
- **THE FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM** THIS MAY BE FURNISHED WITH THE BID IN THE SAME ENVELOPE, IN A SEPARATE ENVELOPE OR MAY BE FAXED HOWEVER PRESENTED, THE CITY MUST HAVE THE SUBCONTRACTOR LISTING WITHIN TWO (2) HOURS OF THE SPECIFIED BID CLOSING TIME.
- **PROJECT REFERENCES FORM** – MUST HAVE AT LEAST THREE REFERENCES OF SIMILAR TYPE AND SIZE PROJECTS SUCCESSFULLY COMPLETED – MUST BE SIGNED AND DATED

Section 220
SCHEDULE OF BID ITEMS - City of Coburg: Coburg Operations Building and
Operations Storage Building Project

ITEM No.	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL BID PRICE
1	Mobilization, Bonds, and Insurance	1	Lump Sum		
2	Authorized Additional Excavation	0	Cubic Yards		
3	3/4"-0 Aggregate Base	1300	Tons		
4	Building #1 (complete)	1	Lump Sum		
5	Building #2 (complete)	1	Lump Sum		
6	Electrical (complete)	1	Lump Sum		
7	Water (complete)	1	Lump Sum		
8	Stormwater (complete)	1	Lump Sum		
9	4" Thick Concrete Walkway	475	Square Feet		
10	3' Wide, 6" Thick Reinforced Concrete Walkway	130	Square Feet		
11	6" Thick Concrete ADA Parking Stall	1	Lump Sum		
12	Construction Staking	1	Lump Sum		
13	Signing and Striping (complete)	1	Lump Sum		
Base Bid Total				\$	

Alternate #1

ITEM No.	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL BID PRICE
A1.1	8" Thick, Reinforced Concrete Valley Gutter	241	Lineal Feet		
A1.2	Asphalt Paving 4" of Level 2, 1/2" Dense HMAC	6,750	Square Feet		

A1.3	4" Thick Concrete Walkway	575	Square Feet		
A1.4	6" Thick, Reinforced Concrete Driveway Apron	250	Square Feet		
Alternate #1 Bid Total				\$	

Alternate #2

ITEM No.	ITEM DESCRIPTION	QTY	UNIT	UNIT COST	TOTAL BID PRICE
A2.1	3/4"-0 Aggregate (additional to Base Bid)	155	Tons	\$	\$
A2.2	3' Wide, 4" Thick Concrete Walkway	120	Square Feet		
A2.3	Raise building FFE 6"	1	Lump Sum		
Alternate #2 Bid Total				\$	

Total Amount of Base Bid \$ _____

Total Base Bid price written out in words

Total Amount of Alternate #1 Bid \$ _____

Total Alternate #1 Bid price written out in words _____

Total Amount of Base Bid Plus Alternate #1 Bid \$ _____

Total Base Bid Plus Alternate #1 Bid price written out in words

Total Amount of Alternate #2 Bid \$ _____

Total Alternate #2 Bid price written out in words _____

Total Amount of Base Bid Plus Alternate #2 Bid \$ _____

Total Base Bid Plus Alternate #2 Bid price written out in words

Note: All Unit Price Bids should be considered as "Furnished and Installed".

Billing is to be as complete units and partial bills will not be paid.

To Be Considered Responsive, the following must be signed and completed by your firm:

We hereby certify to do the work as specified and at the price as quoted in conformance to all the City, State and Federal Regulations that are applicable and will indemnify the 'City of Coburg' against all claims arising out of any actions caused by our company during the performance of this contract.

We hereby certify that we will comply with the provisions of ORS279C.840 (BOLI Wage Requirements).

Company _____

Address _____

By _____
(Signature of Authorized Official)

Date _____

By _____
(Type or Print Name)

Phone _____

Federal I.D. # _____

Fax _____

Surety Company (Performance Bond) _____

Contact at Surety _____ Phone _____

CCB# _____ No. Years Registered w/CCB _____

Are there any outstanding claims against your firm: Yes _____ No _____

Protest of Contractor Selection/Contract Award must be made by Written Notice within Five (5) Days of the Posted Award Date in accordance with OAR 137-049-0450

All the prospective bidders will have specific line items to bid on and the award will be made on the lowest qualified bid on the total bid items. The City will reserve the right to add or delete items as the project goes forward.

1. Liquidated Damages: See General Conditions 110.9.00.
2. Please invoice referencing the above exact line-item numbers and line items. All quantities must be approved by the Project Engineer before invoicing.

**SECTION 230
REQUIREMENTS FOR BID BOND – PLEASE USE YOUR OWN SURETY’S FORMAT**

BID BOND FORMAT

Herewith find a deposit in the form of a certified check, cashier’s check, cash, or bid bond in the amount of \$ _____, an amount which is not less than five percent of the total bid.

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as Principal, and _____, as Surety, are held and firmly bound unto the City of Coburg, Oregon, as obligee, hereinafter called City, in the penal sum of _____ Dollars, for the payment of which the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by these presents.

The condition of this obligation is such that if City shall make any award to the Principal for _____ according to the terms of the proposal or bid made by the Principal therefore, and the Principal shall duly make and enter into a contract with City in accordance with the terms of said proposal or bid and award and shall give bond for the faithful performance thereof, with Surety or Sureties approved by City; or if the Principal shall, in case of failure so to do, pay and forfeit to City the penal amount of the deposit specified in all the bids, then this obligation shall be null and void; otherwise it shall be and remain in full force and effect and the Surety shall forthwith pay and forfeit to City, as penalty and liquidated damages, the amount of this bond.

SIGNED, SEALED AND DATED THIS _____ DAY OF _____, 20_____.

Principal _____

Surety _____

Received return deposit in the sum of \$ _____

_____ 20_____

SECTION 240 - ADDENDA CERTIFICATIONS/ MISTAKES IN BIDS
THE SECTIONS FROM THE OREGON ATTORNEY GENERAL MODEL PUBLIC CONTRACT RULES
ARE HEREIN MADE PART OF THE CONTRACT DOCUMENTS

ADDENDA: We hereby certify that we did receive the following Addenda to these specifications:

_____ dated: _____

_____ dated: _____

_____ dated: _____

CONTRACTOR

DATE

MISTAKES IN BIDS

General.

Clarification or withdrawal of a bid because of an inadvertent, nonjudgmental mistake in the bid requires careful consideration to protect the integrity of the competitive bidding system, and to assure fairness. Except as provided in this rule, if the mistake is attributable to an error in judgment, the bid may not be corrected. Bid correction or withdrawal by reason of a nonjudgmental mistake is permissible but only to the extent it is not contrary to the interest of the public agency or the fair treatment of other bidders.

Mistakes Discovered After Bid Closing but Before Award.

This subsection prescribes procedures to be applied in situations where mistakes in bids are discovered after the time and date set for bid closing but before award.

• **Minor Informalities.**

Minor informalities are matters of form rather than substance that are evident from the bid documents, or are insignificant mistakes that can be waived or corrected promptly without prejudice to other bidders or the public agency; that is, the informality does not affect price, quantity, quality, delivery, or contractual conditions except in the case of informalities involving unit price. Examples include, but are not limited, to the failure of a bidder to:

- Return the number of signed bids or the number of other documents required by the bid documents;
- Sign the bid form in the designated block so long as a signature appears in the bid documents evidencing an intent to be bound;
- Acknowledge receipt of an addendum to the bid documents, but only if:
 - It is clear from the bid that the bidder received the addendum and intended to be bound by its terms; or
 - THE ADDENDUM INVOLVED DID NOT AFFECT PRICE, QUANTITY, QUALITY, OR DELIVERY.

• **Mistakes Where Intended Correct Bid is Evident.**

If the mistake and the intended correct bid are clearly evident on the face of the bid form, or can be substantiated from accompanying documents, the public agency may accept the bid. Examples of mistakes that may be clearly evident on the face of the bid form are typographical errors, errors in extending unit prices, transposition errors, and arithmetical errors. Mistakes that are clearly evident on the face of the bid form may also include instances in which the intended correct bid is made clearly evident by simple arithmetic calculations. For example, missing unit price may be established by dividing the total bid item by the quantity of units for that item, and a missing or incorrect total bid for an item may be established by multiplying the unit price by the quantity when those figures are available on the bid. For discrepancies between unit prices and extended prices, unit prices shall prevail.

• **Mistakes Where Intended Correct Bid is Not Evident.**

The public agency may not accept a bid in which a mistake is clearly evident on the face of the bid form but the intended correct bid is not clearly evident or cannot be substantiated from accompanying documents.

OMISSIONS AND AMBIGUITIES ON THE BID SUBMISSION WILL BE CONSIDERED GROUNDS FOR REJECTION.

SECTION 250
CONTRACT CERTIFICATIONS
(Must be signed and included with Bid Proposal)

We hereby certify that we have carefully examined the Contract Documents for the activity required by the specifications and will, if a trade contract, furnish all machines, tools, apparatus, and other means of construction and do the work and furnish all the materials necessary to complete the work in the manner, in the time, and according to the methods as specified in the Contract Documents.

We hereby certify that if our Proposal is accepted, we will within seven (7) calendar days after Contract award, sign the Contract and will, at that time, deliver to the City of Coburg the Performance and Payment Bond (if required).

NON-COLLUSION AFFIDAVIT

We hereby certify that the bid submitted is genuine and not a sham or collusive bid, or made in the interest or on behalf of any person not therein named; and we further certify that we have not directly or indirectly induced or solicited any bidder or suppliers to put in a sham bid, or any other person or corporation to refrain from bidding; and that we have not in any manner sought by collusion to secure an advantage over any other bidder or bidders.

We hereby agree to furnish the City of Coburg, before commencing the work under this Contract, the certificates of insurance, if specified, in these documents.

We hereby certify that we will represent and warrant all work done by our subcontractors and that the work will be done in a good workmanlike manner under our direct supervision. We will notify the City of Coburg, prior to any subcontract work being done, the name of the subcontractor or subcontractors to be used and the percentage of work that each subcontractor will perform.

CONTRACTOR _____
(Authorized Official)

DATE _____

SECTION 260
OREGON STATUTORY (ORS) CERTIFICATIONS
(MUST BE SIGNED AND INCLUDED WITH BID PROPOSAL)

•**WE HEREBY CERTIFY** to comply with Title VI of the Civil Rights Act of 1964, with Section V of the Rehabilitation Act of 1973, and with all applicable requirements of federal and state civil rights and rehabilitation statues, rules and regulations. **WE CERTIFY** also that we shall comply with the Americans with Disabilities Act of 1990 (Pub L No. 101-336), ORS 659.425, and all regulations and administrative rules established pursuant to those laws. **WE CERTIFY** also to nondiscrimination against any minority, women or emerging small business enterprises in obtaining any required subcontracts.

•**WE HEREBY CERTIFY** that we will and that our subcontractors will, acknowledging that our employers will be subject employers under the Oregon Workers' Compensation Law, comply with ORS 656.017, which requires contractors to provide all workers with compensation coverage.

•**WE HEREBY CERTIFY** that we accept all the terms and conditions contained herein and in the event of a forthcoming contract containing these same terms and conditions we would agree without exception. Any exception to these terms and conditions will be made a minimum of five (5) days before the proposal deadline.

•Whereas, State and Federal law **prohibits discrimination** in employment on the basis of race, color, religion, sex, disability, familial status, or national origin, and whereas the City of Coburg supports and has set-forth a policy of equal employment opportunities for all, the following certification is required: **WE HEREBY CERTIFY**, in the performance of any contract issued from any proposal related to these documents, we will in all respects adhere to the City of Coburg policy of non-discrimination.

Contractor _____
(Authorized Official)

Date _____

EXCEPTIONS to the above Certifications. The Contractor will cross out those items they cannot certify to and then list the reasons for the exception:

SECTION 270

PRIME CONTRACTOR NAME _____

**FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM – PROJECTS OVER \$100,000.00
(ORS 279C.370)**

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

- (1) The subcontractor’s name and address,
- (2) The subcontractor’s Construction Contractor Board registration number, if one is required,
- (3) Dollar amount of work.

If you will not be using any subcontractors that are subject to the above disclosure requirements, you are required to indicate “NONE” on the accompanying form.

THE AGENCY MUST REJECT A BID IF THE BIDDER FAILS TO SUBMIT THE DISCLOSURE FORM WITH THIS INFORMATION BY THE STATED DEADLINE. THE BIDDER MAY SUBMIT THE DISCLOSURE FORM WITHIN THE BID PACKAGE, BY SEPARATE ENVELOPE OR BY FACSIMILE.

CITY OF COBURG OPERATIONS BUILDING AND OPERATIONS STORAGE BUILDING PROJECT

Bid Closing Date: _____ Time (PM): ____

Contractor Name & Address	Work Type	CCB Number	Amount

If you will not be using any subcontractors that are subject to the above disclosure requirements, you are required to indicate “None” on the above contractor listing.

THE CITY OF COBURG MUST REJECT A BID IF THE BIDDER FAILS TO SUBMIT THIS DISCLOSURE FORM WITHIN TWO (2) HOURS OF THE BID CLOSING.

**SECTION 280
PROJECT REFERENCES**

To help the City determine whether Bidder is a responsible bidder pursuant to ORS 279C.375, answer the following questions. An incomplete form or insufficient information on the form may lead to a determination that the Bidder is not responsible for award of this contract.

1. List at least three completed projects of a similar nature. For each project, list the general scope of your work on the project and the nature of the project. Also, for each project, list the location of the project, the owner and the owner's contact information. For each project state whether the project was completed within time and within budget, and if not, explain why not.
2. Provide a list of at least three references that can speak to the Bidder's level of integrity. References from government agencies are preferred.
3. List projects in the table below and attach additional sheets with supplemental information as necessary.

NAME OF PROJECT/ LOCATION	CONTRACT AMOUNT	NAME OF OWNERS CONTACT	PHONE NUMBER OF CONTACT	NOTES
	\$			
	\$			
	\$			
	\$			

CONTRACTOR _____

DATE _____

**Section 300
SAMPLE CONTRACT**

TERMS & CONDITIONS APPLICABLE TO THIS PROJECT

**INDEPENDENT CONTRACT SERVICES AGREEMENT
CITY OF COBURG**

PROJECT: City of Coburg Operations Building and Operations Storage Building Project

This Contract is between the City of Coburg, an Oregon Municipal Corporation ("City") and _____ ("Contractor").

Recital

City of Coburg selected a contractor to perform work for the City by a competitive bid process. Contractor submitted the lowest qualified bid for the Project.

Contractor Information

Address: _____ Phone: _____
Fax: _____ Contact: _____ E-Mail: _____
CCB No.: _____ Fed ID (Tax) No. _____

TERMS & CONDITIONS OF CONTRACT

1. TERM – DURATION OF CONTRACT

This Contract shall be effective when signed by both parties and Contractor has submitted the required certificates of insurance and performance and payment bonds. It shall remain in effect until the work on the Project has been completed, the improvement accepted by the City, and the warranty period has expired. The expiration of the term does not affect any right that arose prior to expiration, and terms that by their nature survive expiration shall remain in effect after expiration.

- Work shall commence as stated in the notice to proceed from City to Contractor
- Work shall be substantially complete by May 31, 2024 and totally complete by June 28, 2024.

2. SCOPE OF WORK

Contractor shall construct **City of Coburg Operations Building and Operations Storage Building Project** (the "Project") in the City of Coburg, Oregon. The Project is located at 91611 North Coburg Road. The Project is described in more detail in the attached Contractor's Proposal "Exhibit A" and as detailed in the City's specifications and drawings for this Project. Contractor hereby agrees to furnish all of the materials, labor, water, tools, equipment, light, power, transportation, and other work needed to construct the Project. Collectively all documents herein, plans, referenced laws, statutes, codes, procedures, material specifications, and schedules are applicable to the scope of Work.

3. PAYMENT

City shall pay Contractor according to the schedules and unit prices as quoted by Contractor "Exhibit A". The maximum total payment under this Contract without approved written change orders is \$_____.

a. Application for Payment

Contractor shall invoice the City monthly for work performed, based on an estimate of the amount of work completed and the value of the completed work. Contractor shall direct the application for payment or invoice to:

Branch Engineering
310 5th Street

Springfield, OR 97477
Attn: Julie Leland
-OR- Via email:
juliel@branchengineerin.com

City shall make progress payment equal to the value of the completed work, less amounts previously paid, less retainage of five percent, less any deduction for claims and damages paid by the City of Coburg due to acts or omissions of the Contractor and for which he/she is liable under this Contract within 15 days of receipt of the invoice and the prevailing wage certificates certifying that he/she has paid not less than the prevailing rate of wages as required by ORS 279C.840. The form/application for payment shall be acceptable to the City of Coburg.

b. Application Free of Encumbrances

Contractor warrants and guarantees that all work, materials and equipment covered by any application for payment, will pass to City of Coburg at the time of payment free and clear of liens, claims, security interests and encumbrances.

c. Engineer Review & Approval of Application for Payment

City Engineer will, after receipt of each application for payment, either indicate in writing his/her approval of payment and present the application to the City of Coburg, or return the application to Contractor indicating in writing his/her reasons for refusing to approve payment. In the latter case, Contractor may make the necessary corrections and resubmit for application.

d. Payment on Estimated Quantities

Nothing contained in this contract shall be construed to affect the right, hereby reserved, to reject the whole or any part of the aforesaid work should such work be later found not to comply with any of the provisions of this Contract document. All estimated quantities of work for which progress payments have been made are subject to review and correction on the final estimate. Acceptance by the Contractor of progress payments based on periodic estimates of quantities of work shall not, in any way, constitute acceptance of the estimated quantities used as the basis for computing the amounts of the progress payments.

e. Final Payment

Final payment shall be made in accordance with Section 111.5.00 of the General Conditions. ("General Conditions" are Section 400 of the Project Manual for the City of Coburg Operations Building and Operations Storage Building Project.)

4. STANDARD OF CARE

Contractor will provide services with the degree of skill and diligence normally employed by professional performing the same or similar services at the time the services are performed. Contractor shall, at all times during the term of this Agreement be duly licensed to perform the Work, and if there is no licensing requirement for the profession or Work. Be duly qualified expert.

5. COMPLIANCE WITH LAW

Contractor shall comply with applicable federal, state and local laws, ordinances, and regulation. When multiple standards apply, Contractor shall comply with the more stringent standard. Contractor shall comply with Title VI of the Civil Rights Act of 1964, with Section V of the Rehabilitation Act of 1973, and will all applicable requirements of federal, state and City civil rights and rehabilitation statutes, ordinances, rules and regulations. Contractor also shall comply with the Americans with Disabilities Act of 1990 (Pub L No. 101-336), (ORS 659A.142), and all regulations and administrative rules established pursuant to those laws. Contractor agrees to comply with ADA in its employment practices, and that it shall perform its contractual obligations consistently with ADA requirements and regulations, state law, and applicable regulations. In addition, Contractor shall comply with all applicable provisions of Oregon law for public contracts. This Agreement incorporates the provisions required to be in an agreement of this type by ORS 279B.200 through 279B.235 (**EXHIBIT B**).

a. Contractor Shall:

- Make payment promptly, as due to all persons supplying to the contractor labor or material for the performance of the work provided for the Contract.
- Pay all contributions or amounts due the Industrial Accident Fund from the Contractor or Subcontractor incurred in the Contract.
- Not permit any lien or claim to be filed or prosecuted against the City.
- Pay to the Department of Revenue all sums withheld from employees under ORS 316.167.
- Demonstrate that an employee drug testing program is in place. City has the right to audit and/or monitor the program. On request by the City, Contractor shall furnish a copy of the employee drug-testing program.
- Salvage or recycle construction and demolition debris, if feasible and cost-effective.

b. Prompt Payment/Contractor Refusal to Make Payment:

- 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 improvement contract as the claim becomes due, the City may pay the 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.
- If Contractor or first-tier Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with this contract within 30 days after receipt of payment from the City (or in a case of Subcontractor, from Contractor), 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 (4) 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 be nine percent per annum. The amount of interest may not be waived
- If Contractor or a Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or material in connection with, the person may file a complaint with the Construction Contractor Board (CCB), unless payment is subject to a good faith dispute as defined in ORS 279C.580.
- The payment of a claim in the manner authorized in this section does not relieve the Contractor or the Contractor's surety from obligation with respect to any unpaid claims.

c. Hours of Labor – Posting Hours of Labor:

- For work under this contract, a person may not be employed for more than 10 hours in any one day, or 40 hours of work in any one week, except in cases of necessity, emergency or when the public policy absolutely requires it, and in those cases, the employee shall be paid at least time and a half pay:
 1. For all overtime in excess of eight hours in any one day or 40 hours in any one week when the work week is five consecutive days, Monday through Friday; and
 2. For all overtime in excess of 10 hours in any one day or 40 hours in any one week when the work week is four (4) consecutive days, Monday through Friday; and
 3. For all overtime in excess of 10 hours in any one day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and
 4. For all work performed on Saturday and on any legal holiday specified in ORS 279C.540.
- Contractor is not required to pay overtime if the request for overtime pay is not filed within 90 days of completion of the Contract if Contractor has posted and maintained in place a circular with the information contained in ORS 279C.545 as required by ORS 279C.545(1).
- Contractors and Subcontractors must give notice in writing to employees who perform work under this contract, 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.

d. Medical Coverage to Employees:

Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation furnishing medical, surgical and hospital care services or other needed care and attention, incident to sickness or injury, to the employees of Contractor, of all sums that Contractor agrees to pay for the services and all moneys and sums that the Contractor collected or deducted from the wages of employees under any law, contract or agreement for the purpose of providing or paying for the services.

e. Worker's 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 exempt under ORS 656.126. Contractor shall insure that each of its Subcontractors comply with these requirements.

6. ENVIRONMENTAL

Contractor shall comply with federal, state and local agencies ordinances, rules and regulations dealing with the prevention of environmental pollution and the preservation of natural resources that affect the performance of the Contract. The City reserves the right if environmental requirements (either new or existing ordinances) must be met after the award of the Contract, City, in accordance with ORS 279C.525, may (a) Terminate the Contract; (b) Complete the work itself; (c) Use non-City forces already under contract with the City; (d) Require that the underlying property owner be responsible for cleanup; (e) Solicit bids for a new Contractor; and (f) Issue the awarded Contractor a change order setting forth the additional work that must be undertaken. In addition, (a) City must make known environmental conditions at the construction site that may require Contractor to comply with environmental ordinances in their bid documents; (b) If not known at the time of award, Contractor shall immediately give notice of the discovered environmental condition to the City; (c) If an environmental emergency exists, City & Contractor shall follow the rules (4), (5), (6), (7) & (8) under ORS 279C.525. If the City chooses to terminate the contract under this subsection, Contractor, if no negligence or omission on his/her part, shall be entitled to all costs and expenses incurred to the date of termination, including overhead and reasonable profits, on the percentage of work completed. If City causes work to be done by another entity, Contractor may not be held liable for actions or omissions of the other entity.

a. Recycle Materials:

Contractor will utilize where applicable, recycled materials if (a) The recycled product is available; (b) The recycled product meets applicable standards; (c) The recycled product can be substituted for a comparable non-recycled product; and (d) The recycled product's cost do not exceed the costs of non-recycled products by more than five percent (5%).

b. Obligation to Pay Subcontractor & Suppliers within 10 Days:

Contractor shall include in each first-tier subcontract, including contracts with material suppliers, a clause that obligates Contractor to pay the first-tier Subcontractor for satisfactory performance under its subcontract within 10 days out of the amounts paid to Contractor by City under this contract, and if payment is not made within 30 days after receipt of payment from City, to pay an interest penalty as specified in ORS 279C.515(2) to the first-tier Subcontractor. The interest penalty does not apply if the only reason the delay in payment is due to a delay in payment by City to Contractor. Contractor shall include in each of Contractor's subcontracts, a provision requiring the first-tier Subcontractor to include a similar payment and interest penalty clause and shall require Subcontractors to include similar clauses with each lower-tier Subcontractor or supplier.

c. Certifications:

By signing the Contract, Contractor will certify that all Subcontractors performing construction work will be registered by the Construction Contractors Board (CCB) or licensed by the State Landscape Contractors Board before the Subcontractor starts work on the Project.

- By signing the Contract, contractor will certify that Contractor and all Subcontractors will maintain all required licenses, permits, certifications or registrations throughout the terms of this agreement.
- By signing the Contract, Contractor will certify that it will comply with Oregon tax laws. In addition: Contractor will be solely responsible for payment of any federal or state taxes required as a result of this Contract/Agreement.

7. INDEMNITY – HOLD HARMLESS

Contractor shall defend and hold harmless CITY, its agents, servants and employees from and against all claims, demands and judgment (including attorney fees), made or recovered against them including, but not limited to damages to real or tangible personal property or for bodily injury or death to any person, arising out of, or in any manner connected with this Agreement, to the extent that any such damage, injury or death is caused by, or sustained in connection with the performance of, Contractor, its employees, servants or agents. CITY shall promptly notify Contractor in a reasonable manner to facilitate the defense of any such claim.

8. INSURANCE

a. General Liability

Contractor shall purchase and maintain commercial general liability insurance with minimum coverage of \$1 million per occurrence and \$2 million aggregate. The policy shall name the City as an additional insured and cover acts and omissions of Contractor and its Subcontractors of any level. Contractor shall be liable for the full amount of any claims resulting from negligence or intentional misconduct of Contractor, its subcontractors, and their officials, agents and employees in the performance of this Contract, even if not covered by or in excess of insurance. In addition, Section 104.3.00, 104.4.00 and 104.5.00 of the General Conditions is applicable to this Contract.

b. Workers Compensation

Workers compensation insurance as required by ORS Chapter 656. Contractor shall ensure that each subcontractor obtains workers compensation insurance. The Contractor shall ensure that its insurance carrier files a guaranty contract with the Oregon Workers' Compensation Division before performing Work. In addition, Section "Oregon State Public Contract Provisions" – subsection "Workers' Compensation" and section "Independent Contractor – Non-Partnership" of this Contract is applicable.

c. Builder's Risk

Contractor shall provide builder's risk insurance on an all risks of direct physical loss basis, including, without limitation, earthquake and flood damage, for amount equal to at least the value of the amount installed. Any deductible shall not exceed \$50,000 for each loss, except that the earthquake and flood deductible shall not exceed 5% of each loss or \$50,000, whichever is greater. The policy shall include the City of Coburg as loss payee. In addition, Section 104.6.00 of the General Conditions is applicable to this Contract.

d. Automobile Insurance

If required, the combined single limit per occurrence shall be in an amount at least equal to the State/DMV requirements. In addition, Section 104.6.01 of the General Conditions is applicable to this Contract.

9. BONDS

a. Payment and Performance Bonds

Immediately upon execution of this agreement, Contractor shall provide a separate Performance Bond and a separate Payment bond in a form acceptable to the City of Coburg. Each bond shall

be equal to 100% of the Contract amount. The Performance Bond and Payment Bond must be signed by the Surety's Attorney-in-fact, and the Surety's seal must be affixed to each bond. Bonds shall not be canceled without the City of Coburg's consent, nor will the City release them prior to Contract completion. Bonds must be originals – faxed or photocopied bond forms will not be accepted.

b. Public Works Bond

Contractor will file with the Construction Contractors Board (CCB) a Public Works Bond with a corporate surety authorized to do business in the State of Oregon in the amount of \$30,000 prior to starting work on this contract. Contractor is aware of the provisions of ORS 279C.600 and 279C.605 relating to notices of claim and payment of claims on public works bonds.

10. CONFLICT OF INTEREST

Contractor shall not give or offer any gift, loan, or other thing of value to any City official or employee. The Contractor shall not rent, lease, or purchase materials, supplies, or equipment, with or through any City official or employee.

11. IMPACT ON TRAFFIC AND PROPERTY

Contractor shall adopt reasonable means and comply with all laws, ordinances, and regulation in order to minimize interference to traffic and damage to both public and private property; And in accordance to 110.4.00 and 110.4.01 of the General Conditions, shall provide a traffic plan, maintain two-way traffic unless approved otherwise by the City of Coburg, and make every effort to maintain public safety and convenience. Contractor shall provide adequate noise control and shall control all obstructions to traffic in accordance with the current edition of the Manual on Uniform Traffic Control Devices (MUTCD) if applicable.

12. PREVAILING WAGE

a. Basic Requirement

In accordance to ORS 279C.840, Contractor shall pay to workers in each trade or occupation the current, applicable State prevailing rate of wage as established by the Oregon State Bureau of Labor and Industries (BOLI). The wage rates applicable are those in effect at the time Project was first advertised.

b. Posting of Prevailing Wage Rates

Contractor, Subcontractor shall post the prevailing wage rates and fringe benefits in the locality where the labor is performed.

c. Certifications of Wage Rates to City of Coburg

Contractor shall furnish weekly to the City of Coburg certified statements, in writing on a form prescribed by the Commissioner of the Bureau of Labor, certifying: (a) The hourly rate of wage paid each worker whom the Contractor the Subcontractor has employed upon the public works improvement; and (b) That no worker employed upon the public works has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the Contract.

d. If the Contractor has not filed the certified statements as required under this contract, The City of Coburg is required by law to retain 25% of any amount earned by the Contractor until the Contractor has complied. Final payment cannot be made without all applicable wage rates on file with the City.

e. Applicability of both Federal (Davis-Bacon) and State (BOLI) Prevailing Wage Rates

When a public works project is subject to the Davis Bacon Act (40 U.S.C.3141 et seq.), the Contractor and every Subcontractor shall pay the higher of the two (BOLI and Davis Bacon) prevailing wage rates.

f. Access to Wage Rate Records – Worker Interview Verification

Contractor shall allow the Bureau of Labor and Industries (or Federal Officials) to enter the office or business establishment of Contractor at any reasonable time to determine whether the prevailing rate of wage and or the higher of the State prevailing wage rate and the Davis-Bacon wage rate is actually being paid and shall make payment records available to BOLI or Federal Officials on request. Contractor shall require Subcontractors to provide the same right of entry and inspection. In addition, shall allow interviews with persons with each discipline (trade) to determine if the correct wage rate is actually being paid.

g. All BOLI Requirements Applicable

Contractor must comply with all laws and regulations relating to prevailing wages, whether or not set out in this Contract. Contractor is to use the most current Prevailing Wage Rates for Public Contracts in Oregon including any amendments to the prevailing rates at time of contract initiation. Further information regarding prevailing wages, including requirements applicable to Contractor, is available at:

http://www.oregon.gov/boli/WHD/PWR/Pages/pwr_state.aspx And available by contacting the Bureau of Labor & Industries at 971-673-0838.

13. WARRANTIES

All work shall be guaranteed for a period of one (1) year against defects in materials and workmanship. Contractor unconditionally warrants all work and materials for this Project, including additional work authorized under change orders, against any defects whatsoever, for one (1) year from the date of acceptance by the City of Coburg, except that manufacturers' warranties and extended manufacturer warranties as specified in the contract documents or otherwise is a standard manufacturer product warranty shall not be abridged. In addition to its right to proceed on the warranty, the City may recover for breach of contract or negligence even if defects do not become evident during the warranty period. The Contractor also agrees to hold the City of Coburg harmless from claims of any kind arising from damage due to said defects. In addition, Section 109.7.00 of the General Conditions is applicable to this Contract.

14. LIQUIDATED DAMAGES

Contractor agrees to pay liquidated damages in accordance to Section 110.9.00 of the General Conditions. The City of Coburg is authorized to deduct the amount of the liquidated damages from any amounts due and the Contractor and its Surety shall be liable for any excess. If the Contract is terminated for default (see following "Termination") and if the Work has not been completed by other means on or before the expiration of Contract time or adjusted Contract time, liquidated damages will be assessed against the Contractor for the duration of time reasonably required to complete the work.

15. TERMINATION OF CONTRACT AND SUBSTITUTED PERFORMANCE

- **Termination for Default** – Termination of the Contract for default may result if the Contractor:
 - Violates any material provision of the Contract;
 - Disregards applicable laws and regulations or the Engineer's instructions;
 - Refuses or fails to supply enough materials, equipment or skilled workers for the prosecution of the Work in compliance to the Contract;
 - Fails to make prompt payment to Subcontractors;
 - Makes an unauthorized general assignment for the benefit of the Contractor's creditors;
 - Has a receiver appointed because of the Contractor's insolvency;
 - Is adjudged bankrupt and the court consents to the Contract termination; or
 - Otherwise fails or refuses to faithfully perform the Contract according to its terms and conditions.

If the Contract is terminated by the City, upon demand the Contractor and Contractor's Surety shall provide the Engineer with immediate and peaceful possession of the Project Site, and of all materials and equipment to be incorporated into the Work, whether located on and off the Project Site, for which the Contractor received progress payments.

If the Contract is terminated for default, neither the Contractor nor its Surety shall be:

- Relieved of liability for damages or losses suffered by the City because of the Contractor's breach of Contract; or
- Entitled to receive any further progress payments until the Work is completed. However, progress payments for completed Work that remain due and owing at the time of Contract termination may be made according to the City's payment terms, except that the Engineer will be entitled to withhold sufficient funds to cover costs incurred by the City as a result of the termination. Final payment to the Contractor will be made according to the City's payment terms.

b. If a termination under this provision is determined by a court of competent jurisdiction to be unjustified, the termination shall be deemed a termination of public convenience.

c. Termination for Public Convenience

- The Engineer may terminate the Contract in whole or in part whenever the Engineer determines that termination of the Contract is in the best interest of the public.
- Notice: The Engineer will provide the Contractor and the Contractor's Surety seven (7) calendar days' written notice of termination for public convenience. After such notice, the Contractor and the Contractor's Surety shall provide the Engineer with immediate and peaceful possession of the Project Site, and of materials and equipment to be incorporated into the Work, whether located on and off the Project Site, for which the Contractor received progress payments.
- Compensation: Compensation for Work terminated by the Engineer under this provision will be determined by the amount of Work completed/installed and materials and equipment furnished and the status of payment (paid/un-paid) for such Work, materials and equipment; less any outstanding labor or material claims against the Contractor.

d. Substituted Performance

According to the City's procedures, and upon the Engineer's recommendation that sufficient cause exists, the City, without prejudice to any of its other rights or remedies and after giving the Contractor and the Contractor's Surety ten (10) calendar days' written notice may:

- Terminate the Contract;
- Substitute the Contractor with another Entity to complete the Contract;
- Take possession of the Project Site;
- Take possession of materials on the Project Site;
- Take possession of materials not on the Project Site, for which the Contractor received progress payments;
- Take possession of equipment on the Project Site that is to be incorporated into the Work;
- Take possession of equipment not on the Project Site that is to be incorporated into the Work, and for which the Contractor received progress payments; and
- Finish the Work by whatever method the City deems expedient.

If within the ten (10) calendar days' notice period provided above, the Contractor and/or its Surety corrects the basis for declaration of default to the satisfaction of the Engineer, or if the Contractor's Surety submits a proposal for correction that is acceptable to the Engineer, the Contract will not be terminated.

16. ASSIGNMENT

Contractor shall not assign or transfer its interests in this contract without written consent of City, which consent may be withheld in the City's sole, subjective discretion; nor shall the Contractor assign any monies due or to become due to him/her hereunder without the previous written consent of the City of Coburg.

17. INDEPENDENT CONTRACTOR – NON-PARTNERSHIP

By its execution of this Agreement, the Contractor shall perform all work under this Project as an Independent Contractor, as that term is used under the laws of the State of Oregon and in accordance with the standards set forth in ORS 670.600, and shall not be considered as an agent of the City of Coburg, nor shall the Contractor's Subcontractors or employees be sub-agents of the City of Coburg. In addition:

- The Work to be rendered under this Project is that of Independent Contractor. Contractor is not an officer, employee, or agent of the City under ORS 30.265 or ORS 30.287, and Contractor is not to be considered an officer, employee or agent of the City for any purpose. Contractor shall be solely and entirely responsible for its act and for the acts of its subcontractors, agents or employees during the performance of this Project. Contractor is an Independent Contractor for the Oregon Workers' Compensation Law (ORS Chapter 656) and is solely liable for workers' compensation coverage under any Contract/Agreement applicable to the Project.
- No Agency, Partnership or Joint Venture – Neither the City or Contractor by virtue of any Agreement applicable to this Project, is a partner or joint venture with the other party in connection with the activities carried out under this Project.
- Any Contract/Agreement applicable to this Project is not intended to entitle the Contractor nor any of its Subcontractors to any benefits generally granted to City Employees. **Contractor shall be responsible for all federal or state taxes** applicable to compensation or payment paid to Contractor under any Contract/Agreement applicable to this Project.

18. FORCE MAJEURE

Contractor shall not be held responsible for delay or default caused by fire, riot, act of God and war which is beyond Contractor's reasonable control. Contractor shall, however, make all reasonable efforts to remove or eliminate such a cause of delay or default and shall, upon the cessation of the cause, diligently pursue performance of its obligations under the Contract.

19. SEVERABILITY

In the event any of the provisions or portion of the Contract/Agreement are held to be unenforceable or invalid by any court of competent jurisdiction for any reason, such invalid or unenforceable provision shall in no way effect the validity or enforceability of the remaining provisions or portions.

20. WAIVERS

No term or condition of this Contract/Agreement shall be deemed to have been waived by any Party, unless such waiver is in writing signed by the Party charged with such waiver. Any waiver of any provision of the Contract, or any right or remedy, given on any one or more occasions shall not be deemed a waiver with respect to any other occasion. The failure of either Party to enforce any provision of the project documents shall not constitute a waiver by the City of that or any other provision.

21. MERGER

No waiver, consent, modification or change of terms of this Contract shall bind either party unless in writing and signed by both parties. A waiver, consent, modification or change, if made shall be effective only in the specific instance and for the specific purpose given. There are no understandings, agreements, or representations, oral or written, not specified herein regarding this Contract. Contractor by signature of its authorized representative hereby acknowledge that Contractor understands the Contract and agrees to be bound by its terms and conditions.

21. LIMITATION OF AUTHORITY

City retains its authority to execute all applications, contracts and other documents relating to the Project. Contractor has no right or authority, express or implied, to commit or otherwise obligate City or any of its partners, except as permitted by the express terms of this Contract, or as authorized in writing.

22. ATTORNEY FEES AND GOVERNING LAW

In the event an action, suit or proceeding, including appeal, is brought for failure to observe any of the terms of this Contract, each party shall be responsible for that party's own attorney fees, expenses, costs and disbursements for the action, suit, proceeding or appeal. The provisions of this Contract shall be construed in accordance with the provisions of the laws of the State of Oregon. Any action or suits involving any question arising under this Contract must be brought in the appropriate court of the State of Oregon.

23. REMEDIES

The remedies provided for in the Contract are cumulative, and in addition to other remedies available at law. Contractor agrees that, due to the health, safety and welfare issues that relate to timely and acceptable completion of the Project to be constructed under this Contract, the City may not have an adequate remedy at law in the event of a breach of this Contract by Contractor, and that the City may obtain injunctive relief at the sole elections of the City.

24. COUNTERPARTS

The Contract may be signed in one or more counterparts (including change orders), each of which shall be an original and all of which, when taken together, shall constitute one and the same instrument.

25. GENDER: SINGULAR - PLURAL

Whenever masculine, feminine, neuter, singular, plural, conjunctive, or disjunctive terms are used in the Contract, they shall be construed to read in whatever form is appropriate to make the Contract applicable to all the Parties and all circumstances, except where the context of the Contract clearly dictates otherwise.

26. INTERCHANGEABLE TERMS IN CONTRACT AND RELATED DOCUMENTS

Contract and Agreement are interchangeable;
City and Owner are interchangeable; and
Engineer, City Engineer are interchangeable – this can be further construed to include Project Manager and or the designee of the City Engineer.

27. NOTICES

All notices of a legal nature shall be in writing and shall be served upon the other party by personal service, by facsimile transmission, E-Mail followed by mail delivery of the original of such notice, by overnight courier with proof of receipt, or by certified mail, return receipt requested, postage prepaid, addressed as follows: City of Coburg, P.O. Box 8316, Coburg, OR 97408, Attn: City Recorder, Phone: 541-682-7850. Service by mail shall be deemed complete on the date of actual delivery or three (3) business days after being sent via certified mail. Service by facsimile transmission or E-Mail shall be deemed served up receipt of the facsimile or E-Mail, followed by mail delivery.

**THE PARTIES SIGNING BELOW WARRANT, REPRESENT AND AGREE THAT THEY HAVE
AUTHORITY TO SIGN THIS AGREEMENT AND AGREE TO ALL TERMS**

CONTRACTOR:

BY: _____

TITLE: _____

DATE: _____

CITY OF COBURG, OREGON

BY: Anne Heath

TITLE: CITY ADMINISTRATOR

DATE: _____

APPROVED AS TO LEGAL SUFFICIENCY:

CITY ATTORNEY

EXHIBIT A

EXHIBIT B

RELEVANT PROVISIONS OF ORS CHAPTER 279B

279B.220 Conditions concerning payment, contributions, liens, withholding. Every public contract shall

contain a condition that the contractor shall:

1. Make payment promptly, as due, to all persons supplying to the contractor for labor or material for the performance of the work provided for in the contract.
2. Pay all contributions or amounts due the Industrial Accident Fund from the contractor or subcontractor incurred in the performance of the contract.
3. Not permit any lien or claim to be filed or prosecuted against the state or a county, school district, municipality, municipal corporation or subdivision thereof, on account of any labor or material furnished.
4. Pay to the Department of Revenue all sums withheld from employees under ORS 316.167.

279B.230 Condition concerning payment for medical care and providing workers' compensation.

1. Every public contract shall contain a condition that the contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation furnishing medical, surgical and hospital care services or other needed care and attention, incident to sickness or injury, to the employees of the contractor, of all sums that the contractor agrees to pay for the services and all moneys and sums that the contractor collected or deducted from the wages of employees under any law, contract or agreement for the purpose of providing or paying for the services.
2. Every public contract shall contain a clause or condition that all subject employers working under the contract are either employers that will comply with ORS 656.017 or employers that are exempt under ORS 656.126. [2003 c.794 §76c]

279B.235 Condition concerning hours of labor.

1. An employer must give notice in writing to employees who work on a public contract, 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.
2. In the case of contracts for personal services as described in ORS 279A.055, the contract shall contain a provision that the employee 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 personal services contracts who are excluded under ORS 653.010 to 653.261 or under 29 U.S.C. 201 to 209 from receiving overtime.
 - a. Except as provided in subsection (4) of this section, contracts for services must obtain a provision that requires that persons employed under the contracts shall receive at least time and a half pay for work performed on the legal holidays specified in a collective bargaining agreement or in ORS 279B.020 (1)(b)(B) to (G) and for all time worked in excess of 10 hours in any one day or in excess of 40 hours in any one week, whichever is greater.
 - b. An employer shall give notice in writing to employees who work on a contract for services, 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.

EXHIBIT C

GOOD FAITH EFFORTS

Six Good-Faith Efforts

Any public water system receiving an award from the Safe Drinking Water Revolving Loan Fund and the Drinking Water Source Protection Fund must ensure good-faith implementation of the six good-faith efforts comprising the federal “Fair Share Program,” for the solicitation of all contractors providing construction, equipment, supplies, engineering or other services that constitute the project financed by the award.

Documentation demonstrating that these six good faith efforts have been taken must be included and maintained in the water system’s project files. Likewise, once a **contractor** has been selected by the water system, that contractor must adhere to the following six good-faith efforts in soliciting its subcontractors:

1. Ensure Disadvantaged Business Enterprises (DBEs) are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, state and local government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources. (Note: The acronym DBE used throughout this document is a global term for Minority Business Enterprises (MBEs) and Women’s Business Enterprises (WBEs).

2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.

3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, state and local government recipients, this will include dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
5. Utilize the services of the Small Business Administration (SBA) and the Minority Business Development Agency of the Department of Commerce.
6. If the prime contractor awards subcontracts, require the prime contractor to take these six good-faith efforts in subcontracting with Disadvantaged Business Enterprises for any subcontract that they let.

Locating Disadvantaged Business Enterprises for Outreach

Applicable MBE / WBEs are certified by the Office of Minority, Women and Emerging Small Business (OMWESB), Small Business Administration, or by a federal agency.

The following sites may be of assistance for locating Minority or Women-Owned Business (MBE / WBE) firms and others may exist too:

- Office of Minority, Women and Emerging Small Business (OMWESB) Directory of Certified Firms at <http://www.oregon4biz.com/How-We-Can-Help/OMWESB/>
- Federal System for Award Management at <https://www.sam.gov>
- Minority Business Development Agency, US Dept. of Commerce at www.commerce.gov/os/ogc/minority-business-development-agency
- EPA's Office of Small Business Programs at www.epa.gov/osbp/
- Oregon Office of Economic & Business Equity at <https://dasapp.oregon.gov/statephonebook/display.asp?agency=12100&division=12103>
- U.S. Department of Transportation at www.dot.gov/osdbu/disadvantaged-business-enterprise

Prevention of Unfair Practices

Finally, there are a number of provisions designed to prevent unfair practices that may adversely affect DBEs that are now required of the prime contractor for every SDWRLF funded project:

- A SDWRLF loan recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment.
- A SDWRLF loan recipient must be notified in writing by its prime contractor prior to any termination of a DBE subcontractor for convenience by the prime contractor.
- If a DBE subcontractor fails to complete work under the subcontract for any reason, the SDWRLF loan recipient must require the prime contractor to employ the Six Good-Faith Efforts if soliciting a replacement subcontractor.
- A SDWRLF loan recipient must require its prime contractor to employ the Six Good Faith Efforts even if the prime contractor has achieved its fair share objectives.

EXHIBIT D

RELEVANT PROVISIONS OF ORS CHAPTER 279B

279B.220 Conditions concerning payment, contributions, liens, withholding. Every public contract shall

contain a condition that the contractor shall:

5. Make payment promptly, as due, to all persons supplying to the contractor for labor or material for the performance of the work provided for in the contract.
6. Pay all contributions or amounts due the Industrial Accident Fund from the contractor or subcontractor incurred in the performance of the contract.
7. Not permit any lien or claim to be filed or prosecuted against the state or a county, school district, municipality, municipal corporation or subdivision thereof, on account of any labor or material furnished.
8. Pay to the Department of Revenue all sums withheld from employees under ORS 316.167.

279B.230 Condition concerning payment for medical care and providing workers' compensation.

3. Every public contract shall contain a condition that the contractor shall promptly, as due, make payment to any person, copartner ship, association or corporation furnishing medical, surgical and hospital care services or other needed care and attention, incident to sickness or injury, to the employees of the contractor, of all sums that the contractor agrees to pay for the services and all moneys and sums that the contractor collected or deducted from the wages of employees under any law, contract or agreement for the purpose of providing or paying for the services.
4. Every public contract shall contain a clause or condition that all subject employers working under the contract are either employers that will comply with ORS 656.017 or employers that are exempt under ORS 656.126. [2003 c.794 §76c]

279B.235 Condition concerning hours of labor.

3. An employer must give notice in writing to employees who work on a public contract, 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.
4. In the case of contracts for personal services as described in ORS 279A.055, the contract shall contain a provision that the employee 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 personal services contracts who are excluded under ORS 653.010 to 653.261 or under 29 U.S.C. 201 to 209 from receiving overtime.
 - c. Except as provided in subsection (4) of this section, contracts for services must obtain a provision that requires that persons employed under the contracts shall receive at least time and a half pay for work performed on the legal holidays specified in a collective bargaining agreement or in ORS 279B.020 (1)(b)(B) to (G) and for all time worked in excess of 10 hours in any one day or in excess of 40 hours in any one week, whichever is greater.
 - d. An employer shall give notice in writing to employees who work on a contract for services, 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.

Section 400
GENERAL CONDITIONS

TABLE OF CONTENTS

101	DEFINITIONS AND ABBREVIATIONS
102	CONTRACT DOCUMENTS
103	THE CITY ENGINEER
104	THE CONTRACTOR AND HIS/HER EMPLOYEES
105	OREGON LAW – CIVIL RIGHTS – WAGE LAWS
106	SAFETY
107	PROTECTION OF PROPERTY
108	MATERIALS AND APPLIANCES
109	CONTRACT LEGALITIES – PERMITS, LICENSES, INDEMNIFICATION
110	PROGRESS OF WORK
111	PAYMENT

GENERAL CONDITIONS

101 DEFINITIONS AND ABBREVIATIONS

101.1.00 DEFINITIONS

Whenever the following terms are used in these Specifications, in the Agreement, in any documents or other instruments pertaining to construction where these Specifications govern, the intent and meaning shall be interpreted as follows, all of which are applicable to both the singular and plural thereof.

AGREEMENT/CONTRACT

The written agreement between Owner and Contractor covering the work to be performed; other Contract Documents are attached to the Agreement. Contract and Agreement for the purpose of this document are interchangeable.

ADDENDUM

A supplement to any of the Contract Documents issued, in writing, after advertisement of but prior to the opening bids for an Agreement.

ADVERTISEMENT

An announcement inviting bids for work to be performed and materials to be furnished.

APPLICATION FOR PAYMENT

The form acceptable to the City of Coburg as approved by the City Engineer/Project Manager – see Section 111.0

AS APPROVED

The words “as approved” unless otherwise qualified, shall be understood to be followed by the words “by the City Engineer.”

BIDDER

Whenever the word “bidder” occurs in these Contract Documents, the work shall signify any person, firm, partnership, or corporation submitting a proposal on this project.

BID SECURITY – BID BOND

The certified check, cashier’s check, or surety bond which is required to be submitted with the Proposal to ensure execution of the Agreement and the furnishing of the required bonds. The amount shall be a minimum of 5% of the total bid price. See Section 109.10.00

CHANGE ORDER

A written order issued after the execution of the Agreement to the Contractor and signed by City of Coburg authorizing an addition, deletion or revision in the work, or an adjustment in the Contract Price or the Contract Time issued after execution of the Agreement – See also extra work and force account work.

CITY

The City of Coburg, including its duly authorized representatives.

CITY COUNCIL

The City Council of the City of Coburg.

CITY ENGINEER

Whenever the words “City Engineer” occurs in these Contract Documents, the words shall signify in addition the City Engineer **or** his/her authorized representative “designee” as directed by him/her. See section 103 “The City Engineer” of this document.

CONTRACT

See Agreement.

CONTRACT DOCUMENTS (COLLECTIVELY ALL DOCUMENTS RELEVANT TO THIS PROJECT)

The "Contract Documents" consist of the Invitation to Bid, the Instructions to Bidders, the Proposal, the Agreement, the General Conditions, the supplementary general conditions, the Specifications, the special specifications, the Contract/Agreement and the plans including all modifications thereof incorporated into the documents before their execution, and including all other requirements incorporated by specific reference thereto. These form the Agreement.

CONTRACT ITEM (PAY ITEM)

A specific unit of work for which a price is provided in the Proposal.

CONTRACT PRICE

The total amount payable to Contractor under the Agreement.

CONTRACTOR

The person or persons, co-partnership, corporation, or joint venture who have entered into an agreement with the City of Coburg as party or parties of the second part, or his/her or their legal representatives. The word "Contractor," although used herein as terming an individual, shall be taken to mean the Contractor, his/her agents, employees, officials, Subcontractors, or anyone connected with the work herein set forth on behalf of the Contractor.

CONTRACT TIME

The number of calendar or workdays stated in the Contract Documents, allowed for completion of work, including authorized time extensions. If a calendar date of completion is stated in the Proposal, in lieu of a number of calendar days, the contract shall be completed by that date.

DAY

Unless otherwise stated, the term "day" shall be taken to mean a calendar day of 24 hours, beginning at 12:00 midnight. Saturdays, Sundays and holidays shall be included.

DEVELOPER

A private entity who has expressed the intention of providing, or who has undertaken the providing, of some facility, structure, or like project to be accepted for maintenance and ownership by the City of Coburg.

DRAWINGS/PLANS

That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

ENGINEER

Wherever the word "Engineer" occurs in these Contract Documents, the word shall signify the "City Engineer" or his/her authorized representative" and vice versa.

EQUIPMENT

All machinery, together with the necessary supplies for upkeep and maintenance, and also all tools and apparatus necessary for the proper construction and acceptable completion of the work.

EXTRA WORK

Work not included in the Contract, but deemed by the Engineer to be necessary to complete the Project. See extra Work and force account Work – Section 111.3.03 in this document.

FORCE ACCOUNT WORK

Items of Extra Work ordered by the Engineer that are to be paid according to Section 111.3.03.

INSPECTOR

An authorized representative of the City Engineer assigned to make all necessary inspections and/or test of the work performed or being performed, or of the materials furnished or being furnished by the City of Coburg.

INTENTION OF TERMS

Whenever, in these Specifications or on the plans, the words “require,” “permitted,” “ordered,” “designated,” “prescribed” or words of the like import are used, it shall be understood that the requirements, permission, order, designation, or prescription of the City Engineer is intended; and similarly, the words “approved,” “acceptable,” “satisfactory,” or words of like import shall mean approved by, or acceptable to, or satisfactory to the City Engineer, subject in each case to the final determination of the City of Coburg.

LABORATORY

The official testing laboratories of the City of Coburg or such other laboratories as may be designated by the City Engineer.

LEGAL HOLIDAY

The following, subject to subsequent change by law, are legal holidays: Sunday, New Year’s Day, Martin Luther King Jr. Day, President’s Day, Memorial Day, Independence Day, Labor Day, Veteran’s Day, Thanksgiving and the day after Thanksgiving, Christmas, and those days declared as holidays by public proclamation. When a legal holiday, other than Sunday falls on a Sunday, the immediate following Monday is a legal holiday.

MATERIALS

Any substance incorporated in the project and equipment and other material consumed in the performance of work.

MODIFICATION

- (a) A written amendment of the Contract Documents signed by both parties.
- (b) A change order.
- (c) Written clarification or interpretation issued by City Engineer.
- (d) A written order for a minor change or alteration in the work issued by City Engineer.
- (e) A modification may only be issued after execution of the Agreement.

NOTICE OF AWARD

The written notice by City of Coburg to the apparent successful Bidder stating that upon compliance with the conditions precedent to be fulfilled by him/her within the time specified, City of Coburg will execute and deliver the Contract to him/her.

NOTICE TO PROCEED

A written notice to the Contractor fixing the date on which to begin the actual contract work. If applicable, the Notice to Proceed shall state the date on which the Contract Time will commence to run.

OR EQUAL

The term “or equal” shall be understood to indicate that the “equal” product is the same or better than the product named in function, performance, reliability, quality, and general configuration. Determination of equality in reference to the project design requirements will be made by the City Engineer. Such “equal” products shall not be purchased or installed by the Contractor without the City Engineer’s written approval.

OWNER

The legal entity or contracting agency for which the work is being performed. Where applicable the Developer is the Owner until such time as the improvements are accepted by the City Council for maintenance.

PAYMENT BOND

The approved form of security furnished by the Contractor and his/her surety as a guarantee that he/she will pay in full all bills and accounts for materials and labor used in the construction of the work. See Section 109.10.00

PERFORMANCE BOND

The approved form of security furnished by the Contractor and his/her surety as a guarantee that the Contractor will complete the work in accordance with the terms of the Agreement. The separate payment bond and the performance bond shall be on the Contractor's own Surety form(s). See Section 109.10.00

PLANS

The term "Plans" refers to the official plans, profiles, cross sections, elevations, details and other working drawings and supplementary drawings, or reproductions thereof, signed by the City Engineer, which show the location, character, dimensions, and details for the work to be performed. Plans may either be bound in the same book as the balance of the Contract Documents or bound in separate sets, and are a part of the Contract Documents regardless of the method of binding.

PREQUALIFICATION – OF BIDDERS

The City of Coburg will prequalify bidders prior to award of the Contract. Bidders must submit the ODOT prequalification form to City, bidders must be registered with the Construction Contractor's Board (CCB) for the work as set forth for this Project and must have the registration with the CCB under the name the bid is submitted under for not less than three (3) years. Bidders must not be on a State or Federal debarred listing.

PROPOSAL

The written offer of the bidder submitted on the approved proposal form setting forth the prices for the work to be performed.

PROPOSAL GUARANTY

See Bid Security and Section 109.10.00

REFERENCE SPECIFICATIONS

Bulletins, standards, rules, methods of analysis or test, codes and specifications.

SPECIAL SPECIFICATIONS/SPECIAL PROVISIONS

Requirements peculiar to the project.

STANDARD SPECIFICATIONS/GENERAL CONDITIONS

Codes, rules and regulations referred to in these Specifications/General Conditions by basic name or designation only, shall be considered to be of the latest issue with all amendments as of the date of these Specifications. Applicable portions of such shall become a part of these Contract Documents.

STRUCTURES

Facilities such as bridges, culverts, catch basins, inlets, retaining walls, cribbing, storm and sanitary sewer lines, waterlines, utility cables and pipelines, under drains, electrical ducts, manholes, hand holes, lighting fixtures and bases, transformers, flexible and rigid pavements; buildings, vaults, and other man-made features that may be encountered in the work and not otherwise classified herein.

SUBCONTRACTOR

An individual, firm, or corporation having a direct contract with the Contractor or any other Subcontractor for the performance of a portion of the work on the project, or those who furnish material for the project.

SUPERINTENDENT

The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the City Engineer, and who shall supervise and direct the construction.

SURETY

A corporation, licensed to conduct the business of surety in the State of Oregon, and named in the current list of approved sureties published by the U.S. Treasury Circular 570. All bonds signed on behalf of the Surety must be accompanied by a certified copy of the authority to act.

If the Surety on any bond furnished by the Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in the State of Oregon, or it ceases to meet the requirements outlined above, Contractor shall within five (5) days thereafter, substitute another Bond and Surety, both of which shall be acceptable to the City of Coburg.

WETLANDS

Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

WORK

Wherever the word "work" occurs in these Contract Documents, the word shall signify all materials, labor, tools and all appliances, machinery and appurtenances necessary to perform and complete everything specified in the Contract Documents or shown on the Plans, and such additional items of labor, material, and equipment not specifically indicated or described which can be reasonably inferred as belonging to the item described or indicated and as required by good practice to provide a complete and satisfactory system or structure. As used herein, "provide" shall be understood to mean, "furnish and install."

WORKING DAY

Any and every calendar day excluding Saturdays, Sundays, and legal holidays. Unless otherwise permitted, a working day occurs between the hours of 7:00 a.m. and 3:30 p.m.

WRITTEN NOTICE

Whenever the term "Written Notice" occurs in these Contract Documents, the term shall signify a written communication delivered in person to the individual, or to a member of the firm, or to an officer of the corporation for whom it is intended, or, if delivered or sent by electronic mail, certified mail or first class mail, to the last business address known to him/her who gives the notice.

101.2.00 ABBREVIATIONS

Wherever in these Specifications, on the plans or in the special specifications the initials only of a society or association are used, the following organizations are referred to:

AASHTO:	American Association of State Highway and Transportation Officials
AGC:	Associated General Contractors of America
AIA:	American Institute of Architects
ANSI:	American National Standards Institute
APWA:	American Public Works Association
ASCE:	American Society of Civil Engineers
ASME:	American Society of Mechanical Engineers
ASTM:	American Society for Testing and Materials
AWWA:	American Water Works Association
BOLI:	Bureau of Labor & Industries
CCB:	Construction Contractors Board
CFR:	Code of Federal Regulations
DBE:	Disadvantaged Business Enterprise
DEQ:	Department of Environmental Quality, State of Oregon
EPA:	U.S. Environmental Protection Agency
FHWA:	Federal Highway Administration, U.S. Department of Transportation
FSS:	Federal Specifications & Standards, General Services Administration
GSA:	General Services Administration
MIL:	Military Specifications
MUTCD:	Manual on Uniform Traffic Control Devices
NEC:	National Electric Code
NEMA:	National Electrical Manufacturers Association
NFPA:	National Fire Protection Association
OAR:	Oregon Administrative Rules
ORS:	Oregon Revised Statutes
OSHA:	Occupational Safety and Health Administration
ODOT:	Oregon Department of Transportation
PUC:	Public Utility Commission, State of Oregon
QA:	Quality Assurance
QC:	Quality Control
UBC:	Uniform Building Code (as adopted by the State of Oregon)
UL:	Underwriters Laboratories, Inc.
UPC:	Uniform Plumbing Code (as adopted by the State of Oregon)
USC:	United States Code

102 CONTRACT DOCUMENTS

102.1.00 INTENT OF CONTRACT DOCUMENTS

The Contract Documents are complimentary, and what is called for by any one shall be as binding as if called for by all. The intent of the Contract Documents is to describe a complete project to be constructed in accordance with the Contract Documents. Any work that may be reasonably inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not it is specifically called for. Materials or work described in words, which so applied, have a well-known technical and trade meaning shall be held to refer to such recognized standards.

102.2.00 INCONSISTENCIES AND OMISSIONS

Any inconsistency, conflict, error or omission found in the Contract Documents shall be reported to the City Engineer in writing immediately and before proceeding with the work affected thereby; however, Contractor shall not be liable to City of Coburg or City Engineer for his/her failure to discover any conflict, error, or inconsistency in the Contract Documents. The City Engineer will clarify inconsistencies or omissions, in writing, within a reasonable time. The decision of the City Engineer shall be final. In resolving inconsistencies among two or more sections of the Contract Documents, precedence shall be given in the following order:

- The more stringent requirement
- Federal requirements
- State requirements
- Modifications, the last in time being the first in precedence, including all Addenda to the Contract Documents.
- Agreements.
- Plans/drawings – figure dimensions on drawings shall take precedence over scale dimensions. Detailed drawings shall take precedence over general drawings.
- Special Specifications
- City's Standards & Specifications
- Instructions to Bidders
- General Conditions
- Reference Specifications

Figure dimensions on plans shall take precedence over scale dimensions. Detailed plans shall take precedence over general plans.

102.3.00 ALTERATIONS AND CHANGE ORDERS

The City of Coburg, without invalidating the Contract, may at any time or from time to time, order extra Work or make changes by altering, adding to, or deducting from the Work. All such Work shall be authorized by Change Order and executed under the conditions of the original Contract, except that claim by either party for time and payment increase or decrease caused thereby shall be adjusted at the time of ordering such change.

The City Engineer may authorize minor changes in the Work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. **The percentage of increase on extra Work involving additional costs will be at the same rates as the "Force Account Work" in section 111.3.03 of these contract documents.**

Extra work performed by Contractor, without authorization of a Change Order, will not entitle him/her to an increase in the Contract Price or to the finding that an emergency circumstance exists that endangers life or property.

If the Work is reduced by alterations, such action shall not constitute a claim for damages based on loss of anticipated profits.

102.4.00 VERIFICATION OF DATA

It is understood and agreed that the Contractor has, by careful examination, satisfied himself/herself as to the nature and location of the work; the conformation of the grounds; the character, quality, and quantities needed preliminary to and during the prosecution of the work; the general and local conditions; and all other matters which can in any way affect the work under this Agreement. No verbal agreement or conversation with any officer, agent, or employee of the City of Coburg, either before or after the execution of this Agreement, shall affect or modify any of the terms or obligations herein contained.

102.5.00 DOCUMENTS TO BE KEPT AT THE WORK SITE

The Contractor shall keep one copy of the Contract Documents at the work site, in good condition, available to the City Engineer and to his/her representatives.

The Contractor shall maintain on the job site, and make available to the City Engineer upon request, one current marked-up set of the Design Drawings which accurately indicate all approved variations in the completed work that differ from the design information shown on the Drawings.

102.6.00 DOCUMENTS TO BE FURNISHED

The City will no longer furnish any additional copies of the Contract Documents or Plans to the Contractor. Additional copies of Contract Documents or Plans may be obtained on request by paying the actual cost of reproducing the Contract Documents or Plans.

102.7.00 OWNERSHIP OF DRAWINGS

All Plans, Drawings, Specifications and copies hereof furnished by the City Engineer are the City's property and are not to be used on other work and, with the exception of the signed contract set, are to be returned on request at completion of the work. Any reuse of these materials without specific written verification by the City Engineer will be at the risk of the user and without any liability or legal expense to the City Engineer. All models are the property of the City of Coburg.

102.8.00 PROJECT WORK SCHEDULES

The Contractor shall submit a Project Work Schedule meeting the Project requirements to the Engineer. The Project Work Schedule is intended to identify the sequencing of activities and time required for prosecution of the Work. The schedule is used to plan, coordinate, and control the progress of construction. Therefore, the Project Work Schedule shall provide for orderly, timely, and efficient prosecution of the Work, and shall contain sufficient detail to enable both the Contractor and the Engineer to plan, coordinate, analyze, document and control their respective Contract responsibilities. The Project Work Schedule will be subject to review, adjustments (collectively by both parties) and approval by the Engineer.

102.8.00 PROJECT PROGRESS REPORT

The Contractor shall submit a progress report to the Engineer each month with their pay application. The report shall include:

- Sufficient narrative to describe the past progress, anticipated activities, and stage Work;
- A description of any current and expected changes or delaying factors and their effect on the construction schedule; and
- Proposed corrective actions.

103 THE CITY ENGINEER

103.1.00 AUTHORITY OF THE CITY ENGINEER

The City Engineer shall be the City of Coburg's representative during the construction and he/she shall observe the work in progress on behalf of the City of Coburg. This general inspection of the construction will not, however, relieve the construction Contractor(s) from his/her (their) obligation to conduct comprehensive inspections and to maintain full responsibility for the techniques and sequences of construction, the safety precautions incidental thereto, and for performing the construction work in accordance with the Contract Documents. He shall also have the authority to reject all work and materials, which do not conform to the Agreement. The City Engineer will, within a reasonable time after their presentation to him/her, make decisions, in writing, on all claims of the City of Coburg or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the Contract Documents. The City Engineer's estimates and decisions shall be the condition precedent to the right of the Contractor to any action on the Agreement and to any right to receive additional money under the Agreement. The Engineer shall have the authority to order changes in the work or extra work, as provided in the paragraph "Alterations and Change Orders" of the Section CONTRACT DOCUMENTS.

The City Engineer will not be responsible and has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his/her work.

103.2.00 ENGINEER'S REPRESENTATIVES

Assistants may be assigned to various portions of the work by the City Engineer. It is understood that such assistants shall have the power, in the absence of the City Engineer, to issue clarifications and make decisions within the limitations of the authority of the City Engineer. The authority of such assistants shall, however, be limited to the particular portion or phase of the work to which they are assigned and by the particular duties assigned to them. Upon request, the assignment and duties of the Inspector or Inspectors will be provided in writing.

103.2.01 AUTHORITY AND DUTIES OF THE INSPECTOR

The Engineer may appoint assistants to inspect all materials used and all work done. Such inspection may extend to any or all parts of the work and to the preparation or manufacture of the materials to be used. The Inspectors will not be authorized to revoke, alter, enlarge or relax the provision on the work to check the necessary lines and grades and to keep the Engineer informed as to the progress of the work and the manner in which it is being done; also to call the attention of the Contractor to any infringements upon plans or specifications, but failure of the Inspector or the Engineer to call the attention of the Contractor to faulty work or infringements upon the plans or specifications shall not constitute acceptance of said work.

An Inspector will not be authorized to approve or accept any portion of the work or to issue instructions contrary to the plans and specifications. The Inspector will have authority to reject defective material and to suspend any work that is being improperly done, subject to the final decision of the Engineer. The Inspector will exercise such additional authority as may, from time to time, be especially delegated to him/her by the Engineer.

103.3.00 INSPECTION

City Engineer and/or Inspector will make periodic visits to the site to observe the progress and quality of the executed work and to determine, in general, if the work is proceeding in accordance with the Contract Documents. He will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the work. His/her efforts will be directed toward providing assurance for the City of Coburg that the completed project will conform to the requirements of the Contract Documents. On the basis of his/her on-site observations as an experienced and qualified design professional, he/she will keep City of Coburg informed in the progress of the work and will endeavor to guard the City of Coburg against defects and deficiencies in the work of Contractors.

103.4.00 REJECTED DEFECTIVE WORK

Engineer or Owner have authority to disapprove or reject Work which Engineer or Owner believes to be defective, or that Engineer or Owner believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer or Owner will also have authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

If any Work is covered contrary to the written request of Engineer or Owner, it must, if requested by Engineer or Owner, be uncovered for Engineer or Owner's observation and replaced at Contractor's sole expense.

If engineer or Owner considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, CONTRACTOR, at Engineer's request shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim.

If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will not conform to the Contract Documents, OWNER shall reserve the right to contract another contractor to correct the

defective work and may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or any Surety for, or employee or Agent of any of them.

CONTRACTOR shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed. CONTRACTOR'S obligations under this paragraph are in addition to any other obligation or warranty. The provisions of this paragraph shall not be construed as a substitute for a waiver of the provisions of any applicable statute of limitation or repose.

103.5.00 UNNOTICED DEFECTS

The City Engineer will not be responsible for the acts or omissions of the Contractor or any Subcontractor or other persons at the site performing any of the work. Any defective work or material that may be discovered by the City Engineer before the final acceptance of work, or before final payment has been made, or during the guarantee period, shall be removed and replaced by work and materials which shall conform to the provision of the Contract Documents. Failure on the part of the Engineer to condemn or reject bad or inferior work or materials shall not be construed to imply acceptance of such work or materials.

103.6.00 RIGHT TO RETAIN IMPERFECT WORK

If any part or portion of the work done or material furnished under this Agreement shall prove defective and not in accordance with the plans and specifications, and if the imperfection in the same shall not be of sufficient magnitude or importance as to make the work dangerous or undesirable, or if the removal of such work will create conditions which are dangerous or undesirable, the City of Coburg shall have the right and authority to retain such work. In such case, if acceptance occurs after approval of final payment, an appropriate amount shall be paid by the Contractor to City of Coburg.

103.7.00 LINES AND GRADES

Lines and grades shall be the responsibility of the Contractor and shall be established under the on-site supervision of a Registered Professional Surveyor or Registered Engineer, licensed in the State of Oregon.

103.8.00 DETAIL DRAWINGS AND INSTRUCTIONS

The City Engineer will furnish, with reasonable promptness, additional instructions by means of drawings or otherwise, as are necessary for the proper execution of the work. All such drawings and instructions will be consistent with the Contract Documents.

103.9.00 SHOP DRAWINGS AND SAMPLE SUBMITTALS

The Contractor shall submit, in quadruplicate, to the Engineer for this review, such shop drawings, electrical diagrams, and catalog cuts for fabricated items and manufactured items (including mechanical and electrical equipment) required by the Contract Documents. Drawings shall be submitted in sufficient time to allow the City Engineer not less than ten (10) regular working days for examining the drawings.

The drawings shall be accurate, distinct, and complete, and shall contain all required information, including satisfactory identification of items, units, and assemblies in relation to the contract drawings and specifications.

Unless otherwise approved by the City Engineer, shop drawings shall be submitted only by the Contractor, who shall indicate by a signed stamp on the drawings, or other approved means, that he/she (the Contractor) has checked the shop drawings, and that the work shown is in accordance with contract requirements and has been checked for dimensions and relationship with work of all other trades involved. The practice of submitting incomplete or unchecked shop drawings for the City Engineer to correct or finish will not be acceptable, and shop drawings which, in the opinion of the City Engineer, clearly indicate that they have not been checked by the Contractor will be considered as not complying with the intent of the Contract Documents and will be returned to the Contractor for resubmission in the proper form.

When the shop drawings have been reviewed by the City Engineer, two sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the drawing may be rejected and one set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit the drawings, in quadruplicate, unless otherwise directed by the City Engineer. No changes shall be made by the Contractor to resubmitted shop drawings other than those changes indicated by the City Engineer.

The review of such drawings and catalog cuts by the City Engineer shall not relieve the Contractor from responsibility for correctness of dimensions, fabrication details and space requirements, or for deviations from the contract drawings or specifications, unless the Contractor has called attention to such deviations in writing by a letter accompanying the drawings and the City Engineer approves the change or deviations in writing at the time of submission, nor shall review by the City Engineer relieve the Contractor from the responsibility for errors in the shop drawings. When the Contractor does call such deviations to the attention of the City Engineer, the Contractor shall state in his/her letter whether or not such deviations involve any deduction or extra cost adjustments. The approval of a separate item as such will not indicate approval of the assembly in which the item functions.

Contractor shall also submit, to City Engineer for approval with such promptness as to cause no delay in work, all samples required by the Contract Documents. All samples shall be clearly identified as to material, manufacturer and any pertinent catalog number if applicable, and the use for which intended.

Where a shop drawing or sample submittal is required by the Contract Documents, no related work shall be commenced until the submission has been approved by the City Engineer.

103.10.0 REJECTION OF NONRESPONSIVE BIDS

The designated person that opens the bids for this Project shall have the authority to determine, at the time and place of the bid opening, what is an acceptable/responsive bid – that bid which can be accepted and that bid which must be rejected. The decision shall include but not limited to the following responsive items: (1) The completed and signed schedule of bid items; (2) The original 5% bid bond is furnished (if required); And (3) The certifications forms are signed and furnished. Acceptable informalities will be consistent with ORS 279 – the “Attorney General’s Model Rules for Public Contracts” including those mistakes that can be substantiated/acceptable from accompanying documents. Omissions that can’t be substantiated from accompanying documents and ambiguities on the bid submissions will be considered grounds for rejection. The bid may also be rejected later if the sub-tier contractor’s form (required for bids over \$100,000) is not received within two hours of the specified bid time and date.

103.10.1 INTERPRETATION OF QUANTITIES IN BID SCHEDULE

Quantities appearing in the Bid Schedule are approximate and are provided only for comparison of Bids. The City of Coburg does not warrant that the actual individual items, amount of Work, or quantities will correspond to those shown in the Bid Schedule. Payment to the Contractor will be made only for actual quantities of Work performed and accepted or Materials furnished and accepted, as required by the Contract. Quantities of Work to be performed and Materials to be furnished may each be increased, decreased, or omitted as necessary as the Work goes forward.

103.10.2 AWARD OF CONTRACT

After the Bids are opened and a determination is made that a Contract is to be awarded, the Contract will be awarded to the lowest responsible Bidder. For the purposes of this Section, "lowest responsible Bidder" means the lowest Bidder who is not on the debarment lists created by the Construction Contractor's Board, Bureau of Labor & Industries or the Federal Excluded Parties List System (EPLS), and who has:

- Substantially complied with all prescribed public bidding procedures and requirements.
- Available the appropriate financial, Materials, Equipment, facility and personnel resources and expertise, or ability to obtain the resources and expertise, necessary to indicate the capability of the prospective Bidder to meet all contractual responsibilities for a complete Project.
- A satisfactory record of performance.
- A satisfactory record of integrity.
- Qualified legally to contract with the City.
- Supplied all necessary information as requested by City in connection with the Project.

If the Bidder is found not to have a satisfactory record of performance or integrity, The City will document the record and the reasons for the unsatisfactory finding. If approved, the City will provide a notice of intent to award. The award will not be final until after the posting date and any protests that may be submitted have been resolved and or partially resolved (findings made) so that the City may proceed with the Project.

Without liability to the City, the City may for good cause cancel Award at any time before the Contract is executed by all parties to the Contract, as provided by ORS 279C.395 for rejection of Bids, upon finding it is in the public interest to do so.

103.10.2 RELEASE OF BID GUARANTIES

Bid guaranties will be released and checks returned seven calendar days after Bids are opened, except for those of three apparent lowest Bidders on the Project. The guaranties of three lowest Bidders will be released and checks returned to unsuccessful Bidders within seven days of the City's execution of the Contract.

104 THE CONTRACTOR AND HIS/HER EMPLOYEES

104.1.00 INDEPENDENT CONTRACTOR – NON-PARTNERSHIP

The Contractor shall perform all work under this Project as an Independent Agent and shall not be considered as an agent of the City of Coburg, nor shall the Contractor's Subcontractors or employees be sub-agents of the City of Coburg.

- The Work to be rendered under this Project is that of an independent Contractor. Contractor is not an officer, employee, or agent of the City under ORS 30.265 or ORS 30.287, and Contractor is not to be considered an officer, employee or agent of the City for any purpose. Contractor shall be solely and entirely responsible for its acts and for the acts of its subcontractors, agents or employees during the performance of this Project. Contractor is an independent Contractor for the Oregon Workers' Compensation Law (ORS Chapter 656) and is solely liable for workers' compensation coverage under any Agreement applicable to this Project.
- No Agency, Partnership or Joint Venture/Independent Contractor – Neither the City or Contractor, by virtue of any Agreement applicable to this Project, is a partner or joint venture with the other party in connection with the other party in connection with the activities carried out under this Project.
- Any Agreement applicable to this Project is not intended to entitle the Contractor nor any of its Subcontractors to any benefits generally granted to City Employees. Contractor shall be responsible for all federal or state taxes applicable to compensation or payment paid to Contractor under any Agreement applicable to this Project.

104.2.00 SUBCONTRACTING

The Contractor shall include, in the space provided in the Letter of Employment of Subcontractors, the legal corporate names of all proposed Subcontractors and the portion of the work that these proposed Subcontractors or other persons or organizations shall perform.

The Contractor for this Project agrees that he/she is as fully responsible to the City of Coburg for the acts and omissions of his/her Subcontractors and of persons either directly or indirectly employed by them as he/she is for the acts and omissions of persons directly employed by him/her.

Nothing contained in the Contract Documents shall create any contractual relation between any Subcontractor and the City of Coburg.

Subcontractors shall be in accordance with, and the Contractor shall be bound by, the following provisions:

- All Subcontractors shall be subject to the approval of the City Engineer.
- All Subcontracts shall be in writing and shall provide that all work to be performed there under shall be performed in accordance with the terms of these Contract Documents.
- If requested, true copies of any and all subcontracts shall be furnished to the Engineer; however, prices may be omitted.
- Subcontractors shall conform to the regulations governing employment of labor.
- The subcontracting of any part of the work will in no way relieve the Contractor of his/her responsibility or liability or obligation under these Contract Documents.

104.3.00 INSURANCE AND LIABILITY

The Contractor is defined as the provider of all construction services for the City of Coburg for this contract, and shall purchase and maintain insurance, naming the City as additionally insured for protection from the claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by the Contractor or by any Subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- Claims under worker's or workmen's compensation, disability benefit and other similar employee benefit acts. (Note: The City would not be additionally insured for Workmen's Compensation.)
- Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- Claims for damages which are sustained (1) by any person as a result of a violation of law, or other conduct that is intentional, reckless, negligent or otherwise, directly or indirectly related to the employment of any person by the Contractor, or (2) by any other person as the result of conduct of the contractor or contractor's employees;
- Claims for damages, other than to the work itself, because of injury to or destruction of tangible property, including loss of use resulting there from; and
- Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

The insurance shall be written for not less than any limits of liability specified in the Contract Documents or required by law, whichever is greater. The specified limit of liability shall be a combined single limit of \$1,000,000 per occurrence, with an aggregate limit of not less than \$2,000,000. Claims-made coverage forms are not acceptable.

Certificates of Insurance acceptable to the City of Coburg shall be filed with the City of Coburg prior to commencement of the work. These certificates shall contain a provision that coverage afforded under the policies will not be cancelled until at least thirty days prior written notice has been given to the City of Coburg.

The Contractor's liability and property insurance with a completed Operations Endorsement shall be maintained after the completion of the project for the full warranty period. Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from his/her operations under this Agreement.

When the construction is to be accomplished within a public or private right-of-way requiring special insurance coverage, the Contractor shall conform to the particular requirements and provide the required insurance. The Contractor shall include in his/her liability policy all endorsements that the said authority may require for the protection of the authority, its officers, agents, and employees.

In case of the breach of any provision of this article, the City of Coburg, at its option, may take out and maintain at the expense of the Contractor such insurance as the City of Coburg may deem proper and may deduct the cost of such insurance from any monies which may be due or become due the Contractor under this Agreement.

104.4.00 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

The Contractor shall not commence work under this Agreement until he/she has obtained all the insurance required hereunder and such insurance has been reviewed by the City of Coburg, nor shall the Contractor allow any Subcontractor to commence work on his/her subcontract until all similar insurance required for that portion of the work has been so obtained. Review of the insurance by the City of Coburg shall not relieve or decrease the liability of the Contractor hereunder.

104.5.00 NO PERSONAL LIABILITY OF PUBLIC OFFICIALS

In carrying out any of the provisions hereof in or exercising any authority granted by the Agreement, there would be no personal liability upon any public official.

104.6.00 BUILDER'S RISK - PROPERTY INSURANCE (IN COURSE OF CONSTRUCTION)

Unless otherwise provided, the Contractor shall purchase and maintain property insurance (builder's risk) upon the entire work at the site to the full insurable value thereof. This type of insurance is required primarily for structures. Street, water and sewer projects would not require structure insurance. This insurance shall include the interests of the Owner and Sub-subcontractors in the work and shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss or damage including, without duplication of coverage, theft, vandalism and malicious mischief. Contractor and Subcontractors will be financially responsible for their own equipment, tools, machinery, and supplies during the course of this project.

If the Owner finds it necessary to occupy or use a portion or portions of the work prior to substantial completion thereof, Contractor shall obtain the consent of the insurance company or companies providing the property insurance, by endorsement to the policy or policies. No insurance shall be canceled or lapsed on account of such partial occupancy or use.

In the event Contractor neglects, refuses or fails to provide the insurance required under the Contract Documents, or if such insurance is canceled for any reason, the Owner shall have the right but not the duty to procure the same and the cost thereof shall be deducted from monies then due or thereafter to become due to Contractor.

104.6.01 COMMERCIAL AUTOMOBILE LIABILITY INSURANCE

Contractor, if required, shall provide commercial automobile liability insurance covering all owned, non-owned, and hired vehicles. The coverage may be written in combination with commercial general liability with separate combined single limit per occurrence shall be in an amount at least equal to the State/DMV requirements.

104.7.00 SUPERVISION

The Contractor shall keep on the project, during its progress, competent supervisory personnel – specifically, at all times during the progress of the Work, Contractor shall assign a competent superintendent thereto who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the site and shall have authority to act on behalf of Contractor. All communications given to or received from

the superintendent shall be binding on Contractor. The Contractor shall designate, in writing, before starting work, an authorized representative who shall have complete authority to represent and to act for the Contractor. The Contractor shall give efficient supervision to the work, using his/her best skill and attention. The Contractor shall be solely responsible for all construction means, methods, techniques, sequence, and procedures, and for providing adequate safety precautions and coordinating all portions of the work, and shall be solely responsible for the compliance to all applicable federal, state, and local laws including OSHA and the Prevailing Wage Laws applicable to this Project under the Agreement. The Contractor shall be responsible to see that the finished work complies accurately with the Contract Documents.

104.7.01 RESPONSIBILITY OF THE CONTRACTOR

Indebtedness incurred for any cause in connection with this work must be paid by the Contractor, and the City of Coburg is hereby relieved at all times from any indebtedness or claim other than payments under terms of the Agreement.

104.8.00 PROPERTY RIGHTS IN MATERIAL

Nothing in the Agreement shall be construed as vesting in the Contractor any right to the property or in the material used after they have been attached or affixed to the work or the soil and accepted by the City of Coburg. All such materials shall become the property of the City of Coburg upon being so attached or affixed and accepted.

104.9.00 COOPERATION BY CONTRACTOR

GENERAL – THE CONTRACTOR SHALL:

- Keep one complete set of Contract Documents available on the Project site at all times.
- Cooperate in good faith with the Engineer, Inspectors, and other Contractors in performance of the Work.
- Provide access, facilities and assistance to the Engineer in establishing such line, grades and points as the Engineer requires.
- Carefully protect and preserve the Engineer's marks and stakes.
- Provide all assistance reasonably required by the Engineer to obtain information regarding the nature, quantity, and quality of any part of the Work.
- Allow the Engineer reasonable access to the Contractor's books and records at all times. To the extent permitted by public records laws, the Engineer will make reasonable efforts to honor the Contractor's request for protection of confidential information.
- Furnish the Engineer all data necessary to determine the actual cost of all, or any part, of the Work.
- Diligently pursue progress of the Work according to the schedule requirements of the Contract and specifications.
- Coordinate and control all Work performed under the Contract, including without limitation the Work performed by Subcontractors.
- Allow the City of Coburg to perform other work on or near the Project Site, including without limitation any Materials site, with forces other than those of the Contractor.

104.10.00 FACILITIES AND SANITATION

If required by law, the necessary sanitary conveniences, properly secluded from public observation, shall be erected and maintained by the Contractor at all times while people are employed on the work; and use of such sanitary conveniences shall be strictly enforced. The location of such conveniences shall be approved by the City Engineer.

104.11.00 EMPLOYEES

The Contractor shall employ only competent skillful workers to do the work. The Contractor shall at all times enforce strict discipline and good order among his/her employees. The Contractor shall comply with all applicable labor rules, wage scales, and regulations, including nondiscriminatory laws, of the Government of the United States, the State, County, and City or Town in which the work is to be done.

105 OREGON LAW – CIVIL RIGHTS – WAGE LAWS

105.0.01 COMPLIANCE TO STATE ORS CHAPTER 279 & ATTORNEY GENERAL MODEL RULES

When the Contract Documents concern public works for the state or any county, municipality, or political subdivision, created by its laws, the applicable statutes of the State of Oregon shall apply. For this reason, Chapters 279A, 279B and 279C of the Oregon Revised Statutes, as amended or superseded, including the latest additions and revisions, are incorporated by reference as part of these Contract Documents and as further defined in the Attorney General's Model Rules. It is understood and agreed that all parties to this Project shall determine the contents of these applicable statutes and comply with their provisions throughout the performance of the Project.

105.0.02 OREGON STATE ENVIRONMENTAL REQUIREMENTS

Contractor shall comply with federal, state and local agencies ordinances, rules and regulations dealing with the prevention of environmental pollution and the preservation of natural resources that affect the performance of the contract. The City reserves the right if environmental requirements (either new or existing ordinances) must be met after the award of the contract, City, in accordance with ORS 279C.525, may (a) Terminate the contract; (b) Complete the work itself; (c) Use non-City forces already under contract with the City; (d) Require that the underlying property owner be responsible for cleanup; (e) Solicit bids for a new Contractor; and (f) Issue the awarded Contractor a change order setting forth the additional work that must be undertaken. In addition, (a) City must make known environmental conditions at the construction site that may require Contractor to comply with environmental ordinances in their bid documents; (b) If not known at the time of award, Contractor shall immediately give notice of the discovered environmental condition to the City; (c) If an environmental emergency exists, City/Contractor shall follow the rules (4), (5), (6), (7) & (8) under ORS 279C.525.

105.0.03 OREGON STATE PUBLIC CONTRACT PROVISIONS

Contractor Shall:

- Make payment promptly, as due to all persons supplying to the contractor labor or material for the performance of the work provided for in the contract.
- Pay all contributions or amounts due the Industrial Accident Fund from the Contractor or Subcontractor incurred in the performance of the contract.
- Not permit any lien or claim to be filed or prosecuted against the City.
- Pay to the Department of Revenue all sums withheld from employees under ORS 316.167.
- Demonstrate that an employee drug testing program is in place. City has the right to audit and/or monitor the program. On request by the City, Contractor shall furnish a copy of the employee drug-testing program.
- Salvage or recycle construction and demolition debris, if feasible and cost-effective.

Prompt Payment/Contractor Refusal to Make Payment:

- 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 improvement contract as the claim becomes due, the City may pay the 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.
- If Contractor or a first-tier Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with this contract within 30 days after receipt of payment from the City (or in a case of Subcontractor, from Contractor), 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 (4) 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 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 contracting agency or from the Contractor, but the rate of interest may not exceed 30 percent. The amount of interest may not be waived.
- If Contractor or a Subcontractor fails, neglects or refuses to make payment to a person furnishing labor or material in connection with this, the person may file a complaint with the Construction

Contractors Board (CCB), unless payment is subject to a good faith dispute as defined in ORS 279C.580.

- The payment of a claim in the manner authorized in this section does not relieve the Contractor or the Contractor's surety from obligation with respect to any unpaid claims.

Hours of Labor – Posting Hours of Labor:

- For work under this contract, a person may not be employed for more than 10 hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency or when the public policy absolutely requires it, and in those cases, the employee shall be paid at least time and a half pay:
 - a. For all overtime in excess of eight hours in any one day or 40 hours in any one week when the work week is five consecutive days, Monday through Friday; and
 - b. For all overtime in excess of 10 hours in any one day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and
 - c. For all overtime in excess of 10 hours in any one day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and
 - d. For all work performed on Saturday and on any legal holiday specified in ORS 279C.540.
- Contractor is not required to pay overtime if the request for overtime pay is not filed within 30 days of completion of the Contract if Contractor has posted and maintained in place a circular with the information contained in ORS 279C.545 as required by ORS 279C545(1).
- Contractors and Subcontractors must give notice in writing to employees who perform work under this contract, 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.

Medical Coverage to Employees:

- Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation furnishing medical, surgical and hospital care services or other needed care and attention, incident to sickness or injury, to the employees of Contractor, of all sums that Contractor agrees to pay for the services and all moneys and sums that the Contractor collected or deducted from the wages of employees under any law, contract or agreement for the purpose of providing or paying for the services.

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 exempt under ORS 656.126. Contractor shall insure that each of its Subcontractors comply with these requirements.

Recycle Materials:

- Contractor will utilize where applicable, recycled materials if (a) The recycled product is available; (b) the recycled product meets applicable standards; (c) the recycled product can be substituted for a comparable non-recycled product; and (d) The recycled product's costs do not exceed the costs of non-recycled products by more than five percent (5%).

Obligation to Pay Subcontractor & Suppliers Within 10 Days:

- Contractor shall include in each first-tier subcontract, including contracts with material suppliers, a clause that obligates Contractor to pay the first-tier Subcontractor for satisfactory performance under its subcontract within 10 days out of the amounts paid to Contractor by City under this contract, and if payment is not made within 30 days after receipt of payment from City, to pay an interest penalty as specified in ORS 279C.515 (2) to the first-tier Subcontractor. The interest penalty does not apply if the only reason the delay in payment is due to a delay in payment by City to Contractor. Contractor shall include in each of Contractor's subcontracts, a provision requiring

the first-tier Subcontractor to include a similar payment and interest penalty clause and shall require Subcontractors to include similar clauses with each lower-tier Subcontractor or supplier.

Certifications:

- By signing the Contract, Contractor will certify that all Subcontractors performing construction work will be registered by the Construction Contractors Board (CCB) or licensed by the State Landscape Contractors Board before the Subcontractor starts work on the Project.
- By signing the Contract, Contractor will certify that it will comply with Oregon tax laws.

105.0.04 TITLE VI CIVIL RIGHTS – AMERICAN WITH DISABILITIES ACT (ADA) - COMPLIANCE

- Contractor shall comply with all applicable federal, state and local laws, ordinances, and regulations. When multiple standards apply, Contractor shall comply with the more stringent standard. Contractor shall comply with Title VI of the Civil Right Act of 1964, with Section V of the Rehabilitation Act of 1973, and with all applicable requirements of federal, state, and City civil rights and rehabilitation statutes, ordinances, rules and regulations. Contractor also shall comply with Americans with Disabilities Act of 1990 (Pub L No. 101-336), ORS 659.425, and all regulations and administrative rules established pursuant to those laws. Contractor also agrees to comply with ADA in its employment practices, and it shall perform its contractual obligations consistently with ADA requirements and regulations, state law, and applicable regulations.

105.0.05 BUREAU OF LABOR & INDUSTRIES (BOLI) & DAVIS BACON PREVAILING WAGE LAWS

- If federal dollars are in part funded for this Project, federal Davis Bacon Wage laws (Davis-Bacon Act (40 U.S.C. 3141 et seq.) and Oregon State prevailing wage laws are applicable. Contractor shall pay workers in each trade or occupation the higher of the applicable federal prevailing wage rate or applicable State prevailing wage rate. Contractor and any Subcontractors shall post the prevailing wage rates and fringe benefits as required by ORS 279C.840.
- Contractor shall furnish weekly to the City of Coburg, attention: Public Works Director or designee, certified statements, in writing, on a form prescribed by the Commissioner of the Bureau of Labor, certifying: (a) the hourly rate of wage paid each worker whom the contractor or the subcontractor has employed upon the public works; and (b) that no worker employed upon the public works has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the contract. If the Contractor has not filed the certified statements as required under this contract, the City of Coburg shall retain 25% of any amount earned by the Contractor until the Contractor has complied. The City of Coburg shall pay the Contractor the amount retained under this subsection within 14 days after the Contractor has filed the certified statements with the City.
- Contractor shall allow the Bureau of Labor and Industries (including federal officials if applicable) to enter the office or business establishment of Contractor at any reasonable time to determine whether the prevailing rate of wage is actually being paid and shall make payment records available to Bureau of Labor and Industries (BOLI) on request. Contractor shall require Subcontractors to provide the same right of entry and inspection.
- City will not make final payment unless the prevailing wage rate certifications are received.
- Contractor must comply with all laws and regulations relating to prevailing wages, whether or not set out in this Contract. Contractor is to use the most current Prevailing Wage Rates for Public Contracts in Oregon including any amendments to the prevailing rates at time of contract initiation. Further information regarding prevailing wages, including requirements applicable to Contractor, is available at: http://www.oregon.gov/boli/WHD/PWR/Pages/pwr_state.aspx Information is also available by contacting BOLI @ 971-673-0839. See also BOLI requirements in the Contract document.

105.0.06 FIRST-TIER SUBCONTRACTOR DISCLOSURE – ORS279C.370

Contractor must submit a First-Tier Subcontractor's Disclosure form (part of bid documents) within two hours of the bid date and time. The First-Tier Subcontractor's form shall list those subcontractors that furnish labor in excess of 5% of bid price (must be at least \$15,000). Subcontractors with amounts over

\$350,000 must be submitted regardless of the percentage. The City will submit this list to BOLI - Contractor cannot alter this list without BOLI's approval. The form is available in the bid document package.

106 SAFETY

The City of Coburg or City Engineer are not responsible to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his/her work.

The Contractor will be solely and completely responsible for conditions of the work site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. Safety provisions shall conform to all applicable State, County, and local laws, ordinances and codes, and to the current safety regulations as set forth in all applicable Oregon Safety Codes.

The Contractor shall also comply with "U.S. Department of Labor Occupational Safety and Health Act" (OSHA), the "Construction Safety Act" administered by the U.S. Department of Labor, the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, and the "Manual on Uniform Traffic Control Devices", except where these are in conflict with state laws, in which case the more stringent requirements shall be followed.

The Contractor shall maintain at his/her office or other well-known place at the work site, all articles necessary for giving first-aid to the injured, and shall establish the procedure for the immediate removal to a hospital or a doctor's care of all persons (including employees) who may be injured on the work site.

The duty of the City Engineer to conduct construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction site.

If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the City Engineer and the City of Coburg. In addition, the Contractor must promptly report in writing to the City Engineer all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses.

If any claim is made by anyone against the Contractor or any Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the City Engineer, giving full details of the claim.

107 PROTECTION OF PROPERTY

The Contractor shall adopt every practical means and comply with all laws, ordinances, and regulations in order to minimize interference to traffic and inconveniences, discomfort, and damage to the public, including the provision of adequate dust control measures. All obstructions to traffic shall be guarded in accordance with the "Manual on Uniform Traffic Control Devices."

The Contractor shall not trespass upon private property and shall be responsible for all injury or damage to persons or property, directly or indirectly, resulting from his/her operations in completing this work. He/she shall comply with the laws and regulations of the City of Coburg, County and State, relating to the safety of persons and property, and will be held responsible and required to make good any injury or damage to persons or property caused by carelessness or neglect on the part of the Contractor or Subcontractor(s), or any agent or employee of either during the progress of the work and until its final acceptance.

The Contractor shall protect against injury any pipes, conduits, utilities, lawns, gardens, shrubbery, trees, fences, or other structures or property, public and/or private, encountered in this work except as stipulated elsewhere herein. The Contractor shall be responsible and liable for any damage to such pipe, structure, and property.

The Contractor shall protect this work and materials from damage due to the nature of the work, the elements, carelessness of other contractors, or from any cause until the completion and acceptance of the work. All loss or damages arising out of the nature of the work to be done under the terms of these Contract

Documents, or from any unforeseen obstruction or defects which may be encountered in the prosecution of the work, or from the action of the elements, shall be sustained by the Contractor.

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 City Engineer, is hereby obligated to act, at his/her discretion, to prevent such threatened loss or injury; and he/she shall so act, without appeal, if so instructed or authorized. Any compensation claimed by the Contractor on account of emergency work shall be determined by agreement or as covered under the Section "Change Orders."

108 MATERIALS AND APPLIANCES

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary for the execution and completion of the work.

Unless otherwise specified, all materials shall be new of USA domestic manufacture and/or foreign manufacture (defined as manufactured outside of the USA) that meets all the ASTM, APWA, Federal Requirements, State Code Requirements, Local City and County Code Requirements that are applicable for the specific materials supplied; and that both the workmanship and materials be of good quality. If the Project is designated as part of a Federal Grant, Contractor will comply to the "Buy America" requirements in all respects. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of the materials.

All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator or processors, except as otherwise provided in the Contract Documents.

Substitution and "Or-Equal" Products – Submittals: Whenever material or equipment are specified or described in the Contract Documents by using the name of a particular manufacturer or supplier, the naming of the item is intended to establish the type, function, and quality required and If the specifications, law, ordinance or applicable rules or regulations permit Contractor to furnish or use a substitute that is equal to any material or equipment specified and if Contractor wishes to furnish to use a proposed substitute, he shall make written application to City Engineer for approval of such a substitute certifying in writing that the proposed substitute will perform adequately the functions called for by the general design, be similar and of equal substance to that specified and be suited to the same use and capable of performing the same function as that specified; stating whether or not its incorporation in or use in connection with the project is subject to the payment of any license fee or royalty; and identifying all variations of the proposed substitute from that specified and indicating available maintenance service. No substitute shall be ordered or installed without the written approval of City Engineer who will be the judge of equality and may require Contractor to furnish such other data about the proposed substitute, as he considers pertinent. No substitute shall be ordered or installed without such performance guarantee and bonds as City of Coburg may require which shall be furnished at Contractor's expense.

Sufficient information on the proposed substitution must be provided by Contractor to the City Engineer to allow the Engineer reasonable time to determine that the material or equipment proposed is equivalent or equal to the named manufacturer's material or equipment. The proposed substitutes or "or equal" shall be submitted, including other equipment that has been specified in the contract documents, to the City Engineer for approval in conformance to the following submittal requirements/procedures/format: (1) The burden of proof as to the type, function, and quality of any substitute material or equipment shall be upon the Contractor; (2) The Engineer shall be the sole judge as to the type, function, and quality of any such substitute material or equipment, and the Engineer's decision shall be final; (3) The Engineer may require the Contractor to furnish, at the Contractor's sole expense, additional data about the proposed substitute; (4) The Owner may require the Contractor to furnish, at the Contractor's sole expense, a special five-year

performance guarantee or other surety with respect to the substitute material or equipment; (5) Acceptance by the Engineer of a substitute item proposed by the Contractor shall not relieve the Contractor of the responsibility for full compliance with the Contract Documents and the adequacy of the substitute item; (6) The Contractor shall be responsible for resultant changes and all additional costs (including redesign) which

the accepted substitution requires in the Contractor's Work; (7) The evaluation and acceptance of the proposed substitute shall not prejudice the Contractor's achievement of substantial completion on time; and (8) Contractor must furnish available maintenance, repair and replacement costs for the substituted equipment.

In selecting and/or approving equipment for installation in the project, the City of Coburg and City Engineer assume no responsibility for injury or claims resulting from failure of the equipment to comply with applicable National, State, and Local safety codes or requirements, or the safety requirements of a recognized agency, or failure due to faulty design concepts, or defective workmanship and materials. The City reserves the right to reject any materials that cannot be certified to meet the applicable codes for the specific product or reject those materials that did not meet the specifications in the Contract Documents; the Contractor will remove and replace such materials with no cost to the City.

108.1.00 MATERIALS FURNISHED BY THE CITY OF COBURG

All materials and/or services furnished by the City of Coburg shall be obtained by the Contractor as indicated in these Contract Documents. The cost of handling and placing City of Coburg furnished materials shall be included in the price paid for the Agreement item involving such material.

108.2.00 SAMPLES, TESTING AND INSPECTION

All materials to be incorporated in the work shall be subject to sampling, testing, and approval. Samples furnished by the Contractor shall be representative of the materials to be used. The City Engineer may select samples or may require that samples to be delivered to and tested as required by the Specifications at the laboratory of the City Engineer, at no additional cost to the City of Coburg.

All sampling and testing of materials shall be done in accordance with the latest designated standard methods of AASHTO, ASTM, etc., or in accordance with special methods designated in the Specifications.

The Contractor shall furnish, without extra charge, the necessary test pieces and samples, including facilities and labor for obtaining the same, as requested by the Engineer. When required, the Contractor shall furnish certificates of tests of materials and equipment made at the point of manufacture by a recognized testing laboratory. The City Engineer and his/her representatives and authorized representatives of public agencies shall at all times have access to the work wherever it is in preparation or progress, and the Contractor shall provide facilities for such access and for inspection, including maintenance of temporary and permanent access routes.

If the Specifications, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the City Engineer timely notice of its readiness for inspection. If the inspection is by authority other than the City Engineer's, the City Engineer shall be given timely notice of the date fixed for such inspection. Inspections by the City Engineer will be promptly made, and where practicable, at the source of supply. If any work should be covered without approval or consent of the City Engineer, it shall, if required by the City Engineer, be uncovered for examination at the Contractor's expense.

Re-examination of questioned work may be ordered by the Engineer; and, if so ordered, the work shall be uncovered by the Contractor. If such work is found not in accordance with the Contract Documents, the Contractor shall correct the defective work at no additional cost to the City of Coburg.

Neither observations by City Engineer nor inspections, tests, or approvals by persons other than the Contractor shall relieve Contractor from his/her obligations to perform work in accordance with requirements of the Contract Documents.

108.3.00 CONTRACTOR'S RESPONSIBILITY FOR MATERIALS

108.3.01 Responsibility For Material Furnished By Contractor

The Contractor shall be responsible for all materials furnished by him/her. All such material shall be examined by a City Representative and any material not meeting Specifications, or that is defective in manufacture, or that has been damaged after delivery, shall be replaced by the Contractor at his/her expense.

108.3.02 Responsibility for Material Furnished By City

The Contractor's responsibility for material furnished by the City shall begin upon Contractor's acceptance at the point of delivery to him/her. All such material shall be immediately examined, and material defective in manufacture and/or otherwise damaged shall be rejected by the Contractor at the time and place of delivery to him/her, to be replaced by the City. Once accepted by the Contractor, defective and/or damaged material discovered prior to final acceptance of the work shall be removed by the Contractor and he/she shall replace, at his/her own expense, the defective material. In such case the Contractor shall furnish all labor, equipment and material incidental to replacement and necessary for the completion of the work to the satisfaction of the Engineer.

108.4.00 CONSTRUCTION STAKING

Registration - Responsibility

The purpose of this section is to define the responsibilities for construction surveying. All survey work shall be conducted by or under the supervision of a Registered Professional Land Surveyor or Professional Engineer, licensed in the State of Oregon. **The Contractor will be responsible for providing all construction staking as required to complete the work.**

Staking – Scope - Methodology

Construction stakes and stakes which are reference points for construction work shall be conspicuously marked. It shall be the responsibility of the Contractor to inform his/her employees and his/her Subcontractors of their importance and the necessity for their preservation.

Construction staking shall be provided at 50-foot intervals on tangent and 25-foot intervals on curve. The guard stakes should contain the following information:

- Engineer's station (on back)
- Offset from line (circled)
- Offset from control point (circled)
- Cut or fill to grade
- Distance right or left from centerline on curb stakes (on back)

Flagging Code for Staking

A color code may be established during the course of the project indicating specific colors for the various kinds of stakes to be set.

Staking Sewer Lines

Both gravity and pressure sewer lines shall be construction staked by means of an offset line with pipe invert cut information provided. Finish grades shall be provided as required.

Manholes shall have two reference points (swing-ties) indicating the center of the manhole, flow invert elevation, and finish grade. Upon the completion of sub-grade, the top of the manhole shall be staked with the finish grade and elevation by means of four offset stakes in a cross pattern so that the street slope and cross slope will be matched perfectly. Services shall be staked as required by the Engineer.

Staking Water Lines

Waterlines shall be staked by means of a horizontal offset line at the appropriate intervals.

Fire hydrants shall have two reference points (swing-ties) indicating the center of the fire hydrants. Finish grades shall be provided as required. Services shall be staked as required by the Engineer.

Staking Streets

Prior to commencing construction, clearing limits shall be established.

Where a significant (greater than 3-foot) cut or fill is required for sub-grade, slope stakes and construction staking for sub-grade will be provided.

Curb line shall be staked by means of an offset line no more than 6-feet offset from the face of curb, showing the cut or fill to the finish work. Said stakes shall be protected and saved for a period of five (5) working days after construction of curbs to enable the Inspector to approve the alignment and grade. In addition to the above staking requirements, catch basins, points of curvature and tangency, and ends of curb radii shall be provided with a curb stake.

Base rock shall be staked by painting an appropriate target on the curb and providing construction stakes (blue tops) on centerline. On streets of 48-feet or greater width, blue tops will also be required at the quarter points. Blue tops will also be provided at the gutter line for the centerline and gutter lines of any intersecting street.

Staking Structures

All structures shall be staked to the line and grade as shown on the plans or as directed by the Engineer.

109 CONTRACT LEGALITIES

109.1.00 PERMITS AND LICENSES

The Contractor shall keep himself/herself fully informed of all local ordinances. State and Federal laws, ordinances and regulations, in any manner affecting the work herein specified. He/she shall, at all times, comply with said ordinances, laws, and regulations, and protect and indemnify the City of Coburg and officers and agents against any claim or liability arising from or based on the violation of such laws, ordinances, or regulations. Permits and licenses of a temporary or construction nature including government charges and inspection fees necessary for the prosecution of the work shall be secured and paid for by the Contractor. Easements and right-of-ways shall be secured and paid for by the City of Coburg, unless otherwise stipulated in the plans and specifications. Further defined as follows:

Contractor Permits and Licenses – Contractor Shall:

- Obtain all necessary permits and licenses, except those noted below by City;
- Pay all applicable charges, fees and taxes, except those noted below by City;
- Give all notices required by applicable laws, or under the terms of the Contract;
- Obtain all building specialty work permits: ex: heating, ventilation, air conditioning, electrical, etc.
- Comply with ORS 274.530 relating to lease of stream beds by Oregon Div. of State Lands;
- License, in the State of Oregon, all vehicles subject to licensing;
- Comply with ORS 477.625 and ORS 527.670 relating to clearing & fire hazards on forest lands; &
- Comply with all orders and permits issued by a governmental authority, whether local, State, or federal.

City Permits and Licenses – City Shall:

- Obtain necessary Rights-of-Way permits – except unless required to be obtained in the name of the Contractor;
- Obtain permits required for crossing or encroaching upon navigable streams;
- Obtain permits required for removing materials from or depositing materials in waterways;
- Obtain permits required for operating in City-controlled source of Materials or disposal area;
- Pay the City's System Development Charges (SDC's);
- Obtain building construction permits, not including specialty work as noted above; and
- Obtain environmental permits, including erosion control permits.

109.2.00 ROYALTIES AND PATENTS

The Contractor shall pay all royalty and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the City of Coburg harmless from loss on account thereof, except that the City of Coburg shall be responsible for all such loss when a particular process or the product of a particular manufacturer or manufacturers is specified; but if the Contractor has information that the process or article specified is an infringement of a patent, he/she shall be responsible for such loss unless he/she promptly gives such information to the City Engineer or City of Coburg.

109.3.00 TAXES AND CHARGES

The Contractor agrees to withhold and pay any and all withholding taxes, whether State or Federal, sales tax, and to pay all Social Security charges and also all State Unemployment Compensation charges, and to pay or cause to be withheld, as the case may be, any and all taxes, charges, or fees or sums whatsoever which are now or may hereafter be required to be paid or withheld under any laws.

109.4.00 HOLD HARMLESS

Contractor shall defend, indemnify, and hold the City, its officers, agents and employees, harmless against all liability, loss, or expenses, including attorney's fees, and against all claims, actions or judgments based upon or arising out of damage or injury (including death) to persons or property caused by or resulting from any act or omission sustained in connection with the performance of the Contract/Agreement or by conditions created thereby, or based upon violation of any statute, ordinance or regulation or related to the following:

- 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.
- 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.
- 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 of expense is caused in part by a party indemnified hereunder.
- Any lien filed upon the project or bond claim in connection with the Work.

In claims against any person or entity indemnified under this Subsection 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 this Subsection shall not be limited by a limitation or amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefits acts or other employee benefit acts.

109.5.00 UNFORESEEN DIFFICULTIES

The Contractor shall protect his/her work and materials from damage due to the nature of the work, the elements, carelessness of other contractors, or from any cause whatever until the completion and acceptance of the work. All loss or damage arising out of a nature of the work to be done under these Contract Documents, or from any unseen obstruction or defects which may be encountered in the prosecution of the work, or from the action of the elements shall be sustained by the Contractor.

109.6.00 CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

If the work should be stopped under an order of any court or other public authority for a period of three (3) months, through no act or fault of the Contractor or of anyone employed by him/her; or if the City Engineer should fail to issue any estimate for payment within thirty (30) days after it is due; or if the City of Coburg should fail to pay the Contractor within thirty (30) days after the time specified in the paragraph "Partial Payment" of the Section "Payment" any sum certified by the City Engineer, then the Contractor may, upon fifteen (15) days written notice to the City of Coburg and the City Engineer, stop work or terminate this Agreement and recover from the City of Coburg payment for all work executed and any loss sustained upon any plant or material and reasonable profit and damages, unless said default has been remedied within said time.

109.7.00 WARRANTIES

All work shall be guaranteed for a period of one (1) year against defects in materials and workmanship. Contractor unconditionally warrants all work and materials for this Project, including additional work authorized under change orders, against any defects whatsoever, for one (1) year from the date of

acceptance by the City of Coburg, except that manufacturers' warranties and extended manufacturer warranties as specified in the contract documents or otherwise is a standard manufacturer product warranty shall not be abridged – such unexpired manufacturer warranties and guarantees shall be transferred to and enforceable by the City of Coburg. In addition to its right to proceed on the warranty, the City may recover for breach of contract or negligence even if defects do not become evident during the warranty period. The Contractor also agrees to hold the City of Coburg harmless from claims of any kind arising from damage due to said defects. In addition:

- Contractor shall perform all work in accordance with all specifications for the Project and warrants that all completed work meets all Project specifications, correcting any work at his/her own expense not in compliance with specifications, and for all repairs of damage to other improvements, natural and artificial structures, systems, equipment, and vegetation caused by, or resulting in whole or in part from occurrences beginning during the warranty period and are the result of defects in construction of materials installed under the contract. Contractor shall be responsible for all costs associated with site cleanup and remediation caused by, or resulting in whole or in part from, defects in its work or materials.
- Within ten (10) calendar days of the City's written notice of defects, Contractor or Contractor's Surety shall start repair of the defects and all related damage. If Contractor or Contractor's Surety fails to correct and repair the defects in a timely manner, the City may have the correction and repair done by others. Contractor or Contractor's Surety shall promptly reimburse the City for all expenses incurred to correct and repair the defects.
- In case of emergency where delay could result in serious loss or damage, the City may make emergency corrections and repairs, without written notice. Contractor or Contractor's Surety shall promptly reimburse the City for all expenses incurred to correct and repair the defects.
- All work done to comply with the warranty shall itself be warranted for one year beginning on the date of the City's acceptance of the corrections, repairs, replacements or changes.
- The warranty provision shall survive expiration or termination of the Contract.

109.8.00 RELEASE OF LIENS

On public projects, neither the final payment nor any part of the retained percentage shall become due until the Contractor submits to the City of Coburg a signed affidavit, satisfactory to the City of Coburg, stating that so far as he/she (the Contractor) has knowledge or information, all accounts for materials, labor, and incidentals in connection with the work have been paid in full. The form of affidavit shall be satisfactory to the City of Coburg. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the City of Coburg all monies that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

109.9.00 CONTRACTOR'S AND MANUFACTURER'S COMPLIANCE WITH STATE, OSHA, AND OTHER CODE REQUIREMENTS

The completed work shall include all necessary permanent safety devices such as machinery guards and similar ordinary safety items required by the State and Federal (OSHA) industrial authorities and applicable local and national codes. Further, any features of the work (including City of Coburg selected equipment) subject to such safety regulations shall be fabricated, furnished, and installed in compliance with these requirements. Contractors and manufacturers of equipment shall be held responsible for compliance with the requirements included herein.

109.10.00 BOND REQUIREMENTS

109.10.01 BID SECURITY - BID BOND

When so designated by the Project Manager/City Engineer, in the Contract Documents, and or as advertised, the Contractor shall furnish a certified check, cashier's check, or surety bond in the amount of 5% of their bid price to guarantee their bid price for the project designated in these documents. In the event Contractor will not honor their bid price, if chosen for the project, the bid bond will be forfeited to the City. If the certified check, cashier's check or surety bond in the amount of 5% (or more) of the bid price is not submitted with the bid, the bid will be rejected.

109.10.02 PAYMENT AND PERFORMANCE BONDS

Contractor, prior to the execution of the contract, shall provide a separate Payment Bond and a separate Performance Bond in a form acceptable to the City of Coburg. Each bond shall be equal to 100% of the contract amount. The Payment Bond and Performance Bond must be signed by the Surety's Attorney-in-Fact, and the Surety's seal must be affixed to each bond. Bonds shall not be canceled without the City of Coburg's consent, nor will the City release them prior to Contract completion. Bonds must be originals – faxed or photocopied bond forms will not be accepted.

109.10.03 PUBLIC WORKS BOND

Contractor will file with the Construction Contractor's Board (CCB) a Public Works Bond with a corporate surety authorized to do business in the State of Oregon in the amount of \$30,000 prior to starting work on the project. Contractor will make themselves aware of the provisions of ORS 279C.600 and ORS 279C.605 relating to notices of claim and payment of claims on Public Works Bonds.

109.10.04 WARRANTY BOND – SUPPLEMENTAL WARRANTY PERFORMANCE BOND

Contractor will furnish a warranty bond, from its Surety, as a guaranty of the Contractor's performance of its warranty obligations; And if the Project requires a coating system, a coating system warranty (reservoir tanks, etc.) is required, in addition to the regular Performance Bond in the sum of 80% of the full contract amount. The bond is to secure the performance by the Contractor of correction work on any coating system defects that the Contractor may be directed by the City of Coburg to perform. Upon Third Notification, the supplemental warranty performance bond shall become effective and shall continue in full force and effect until the City of Coburg has advised the Contractor that: (1) There are no coating system defects; or (2) If the Contractor has been notified that there are coating system defects, the defects have been repaired by the Contractor to the satisfaction of the City as specified under the coating system warranty and the full warranty period has expired.

110 PROGRESS OF THE WORK

110.1.00 BEGINNING OF THE WORK

Before work shall be started and materials ordered, the Contractor shall meet and consult with the City Engineer relative to materials, equipment, and all arrangements for prosecuting the work. The Contractor shall commence the work contemplated under these Contractor Documents within three (3) days after the City of Coburg's written notice to proceed unless otherwise notified by the City Engineer, and shall complete the work within the time specified in the Agreement, it being expressly understood and agreed that the time of beginning, rate of progress, and time of completion of the work are of the essence of this Agreement.

110.2.00 PROSECUTION OF THE WORK

The work shall be prosecuted at such time, and in or on such part or parts of the project as may be required, to complete the project as contemplated in the Contract Documents. Time/schedule/completion is as set forth in the contract. Upon starting construction, the Contractor shall diligently and continuously pursue completion of the work with adequate crew and equipment. Should the Contractor, without the express approval of the Engineer, reduce his/her effort, it shall be considered a failure of the Contractor to complete the work in the time agreed upon. As such it shall fall under the provisions of 110.9.00 LIQUIDATED DAMAGES and liquidated damages may be assessed for each day of reduced operations. It is expressly understood and mutually agreed between all parties to the Agreement that the City Engineer shall not determine or be responsible for construction methods.

The Contractor shall perform the work and take such precautions as he/she may deem necessary to complete the project so all work will be in conformance with the Contract Documents/specifications within the Contract time.

If the Contractor desires to carry on work at night or outside the regular hours, he/she may submit application to the City Engineer; but he/she shall allow ample time to enable satisfactory arrangements

to be made for inspecting the work in progress. If granted permission, he/she shall light the different parts of the work in a manner satisfactory to the City Engineer and shall comply with all regulations of the City or State or other public body having jurisdiction.

The Contractor shall complete the work called for under the contract in all parts and requirements within the number of workdays, or before the completion date, as set forth in the contract.

The Contract workday requirement shall take precedence over other completion dates that may be referred to in these documents.

Where such case applies, a notice to proceed may be issued to the Paving Contractor when individual streets have been constructed and approved for base rock by the Engineer. Once the base rock has been delivered and spread, it shall be the Paving Contractor's responsibility to maintain the surface, including blading and watering as may be required. It is the intent of these Specifications that paving commence immediately following the placement of base rock.

110.3.00 COOPERATION WITH UTILITIES

The Contractor is responsible for coordinating with utility owners. Before the Contractor performs any excavation he/she is to contact the Oregon Utility Notification Center at 1-800-332-2344 at least forty-eight (48) hours prior to excavation. Subject to the Engineer's approval, the Contractor may adjust the Utilities by asking the Utility owners to move, remove, or alter their facilities in ways other than as shown on the Plans or in any Supplemental Specifications. The Contractor shall conduct all negotiations, make all arrangements, and assume all costs that arise from such changes. The Contractor shall conform to the requirements of ORS 757.541 through 757.993 and with the rules of the Oregon Utility Notification Center, OAR 952-001-0010 through OAR 952-001-0090. The Contractor may contact the Oregon Utility Notification Center at 503-232-1987 about these rules.

110.4.00 MAINTAINING TRAFFIC

The Contractor shall adopt reasonable means and comply with all laws, ordinances, and regulation in order to minimize interference to traffic; be responsible to maintain two-way traffic at all times unless otherwise specified. The streets shall be open for two-way traffic at all times when the Contractor is not performing work unless otherwise specified. Approaches to all properties accessing to the project shall be maintained by the Contractor at all times except for short periods necessary to the progress of the construction. Contractor, in addition, shall provide adequate noise control and control all obstructions to traffic in accordance with the manual on uniform traffic control devices if applicable.

110.4.01 PUBLIC SAFETY AND CONVENIENCE

The Contractor shall conduct the project with proper regard for the safety and convenience of the public. When the project involves use of public ways, the Contractor shall provide certified Flaggers when directed, a temporary traffic control plan approved by the City Engineer, and install and maintain means of free access to all fire hydrants, service stations, warehouses, stores, houses, garages and other property.

Private residential driveways shall be closed only with approval of the Engineer or specific permission of the property owner. The Contractor shall not interfere with normal operation of public transit vehicles unless otherwise authorized. The Contractor shall not obstruct or interfere with travel over any public street or sidewalk without approval. Where detours are necessary, they shall be maintained with good surface and shall be clearly marked. The Contractor shall provide open trenches and excavations with adequate barricades of an approved type, which can be seen from a reasonable distance. At night, the Contractor shall backfill all open work and mark areas with signs and lighted barricades (Type A Low Intensity Flashing Warning Light on a Type I or II barricade, typical) in accordance with the MUTCD. The Contractor shall install and maintain all necessary signs, lights, flares, barricades, railings, runways, stairs, bridges and facilities. The Contractor shall observe all safety instructions received from the Engineer or governmental authorities, but following of such instructions shall not

relieve the Contractor from the responsibility or liability for accidents to workers or damage or injury to person or property.

Emergency traffic such as police, fire and disaster units shall be provided reasonable access to the work area at all times. The Contractor shall be liable for any damages, which may result from failure to provide such reasonable access or failure to notify the appropriate authority.

110.4.02 PUBLIC SAFETY – USE OF EXPLOSIVES

Contractor shall comply with all Laws pertaining to the use of explosives. The Contractor shall notify anyone having facilities near the Contractor's operations of Contractor's intended use or storage of explosives. The Contractor shall be responsible for all damage resulting from its own, its agents and employees; and its Subcontractors' use of explosives.

110.5.00 ASSIGNMENT

Contractor shall not assign or transfer its interests in the Contract without written consent of City, which consent may be withheld in the City's sole, subjective discretion; nor shall the Contractor assign any monies due or to become due to him/her hereunder without the previous written consent of the City of Coburg.

110.6.00 CITY OF COBURG'S RIGHT TO DO WORK

If the Contractor should, in the opinion of the City Engineer, neglect to prosecute the work properly or should neglect or refuse at his/her own cost to take up and replace work that has been rejected by the City Engineer, then the City of Coburg shall notify the Surety of the condition and after ten (10) days written notice to the Contractor and the Surety, or without notice if an emergency or danger to the work or public exists, and without prejudice to any other right which the City of Coburg may have under the Agreement, take over that portion of the work which has been improperly executed and make good the deficiencies and deduct the cost thereof from the payments then or thereafter due the Contractor.

110.7.00 CITY OF COBURG'S RIGHT TO TERMINATE AGREEMENT

According to the City's procedure, and upon the Engineer's recommendation that sufficient cause exists, the City, without prejudice to any of its other rights or remedies and after giving the Contractor and the Contractor's Surety ten (10) calendar days' written notice may terminate the Contract and take possession of the materials and equipment in accordance with the Contract section titled "Termination of Contract and Substituted Performance" - this section is in force for this Project.

110.8.00 DELAYS AND EXTENSION OF TIME

If the Contractor shall be delayed at any time in the progress of the work by any act or neglect of the City of Coburg or the City Engineer, or of any employee of either; or by any separate contractor employed by the City of Coburg; or by changes ordered in the work; or by strikes, lockouts, fire, unavoidable casualties, or any cause beyond the Contractor's control which justified the delay, or by delay authorized in writing by the City Engineer, then the date for completion of the work shall be extended. Within 14 days after the Contractor submits to the City Engineer a written request for an extension of time, the City Engineer will determine the number of days extension due to the Contractor. The City of Coburg will make the final decision on all requests for extension of time.

No such extension shall be made for delays occurring more than seven (7) days before claim therefore is made in writing to the City Engineer. In case of a continuing cause of delay, only one claim is necessary.

If no schedule or agreement stating the date upon which supplemental drawings shall be furnished by the City Engineer is made, then no claim for delay shall be allowed the Contractor on account of failure to furnish drawings until two (2) weeks after demand for such drawings, and not then unless such claim be reasonable. No extension of time will be granted to the Contractor for delays occurring to parts of the work that have no measurable impact on the completion of the total work under this Agreement.

No extension of time will be considered for weather conditions normal to the area in which the work is being performed. Unusual weather conditions, if determined by the City Engineer to be of a severity

that would stop all progress of the work, may be considered as cause for an extension of Agreement completion time.

Delays in delivery of equipment or material purchased by the Contractor or his/her Subcontractors (including City of Coburg selected equipment) shall not be considered as a just cause for delay. The Contractor shall be fully responsible for the timely ordering, scheduling, expediting, delivery, and installation of all equipment and materials.

The contract time may only be changed by a Change Order.

110.9.00 LIQUIDATED DAMAGES

CONTRACTOR recognizes and acknowledges that the City will incur significant additional expenses and costs in staff time, administration and overhead ("Additional Internal Costs") as a result of any delay by Contractor in completing all work by the completion date established by this contract. Contractor agrees that it is liable for the City's Additional Internal Costs resulting from any delay in completion of the work. Contractor recognizes that, in addition to Additional Internal Costs, the City will incur additional costs and expenses as a result of any delay in completion of all work under this contract as the result of the necessity for City to retain other contractors, consultants and engineering and/or design firms ("Additional External Costs") in the event of any delay in completion of the Work. Contractor agrees that it is liable for the City's Additional External Costs resulting from any delay in completion of the work. In addition, City will incur additional costs in the event of delay in completion of work under this contract because City would be unable to utilize the new facility to be constructed under this contract or to utilize services to be provided under this contract. ("Loss of Use" costs.) Contractor agrees that it is liable to City for Loss of Use costs resulting from a delay in completion of the work. The City and Contractor agree that the amount of damages resulting from a delay in completion of the work is uncertain and in an amount of damages that will be difficult to prove. The Contractor and the City agree that it is appropriate to liquidate damages in advance, due to the uncertain nature of the amount of damages that City will incur in the event that Contractor fails to complete all work by the scheduled completion date. Contractor is required to provide public facilities and/or services that are vital to the health, safety and welfare of the general public. City's costs for protecting the health, safety and welfare in the event that the work is not completed by the scheduled completion date will be substantial. Contractor and City agree that the amount of liquidated damages provided by this contract is reasonable, specifically bargained for, and not a penalty. Contractor further agrees that it will not challenge the amount or the imposition of these damages in any action seeking to enforce these damages.

It is agreed that the amount of such additional expense and damage incurred by reason of failure to complete the work by the designated completion date shall be \$1,000.00 (one thousand dollars) for each workday the work exceeds the number of workdays specified.

The City of Coburg is authorized to deduct the amount of such damages from any monies due the Contractor for work performed or material furnished under this Agreement; and the Contractor and his/her Sureties shall be liable for any excess.

110.10.00 OTHER CONTRACTS

The City of Coburg reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and execution of their work and shall properly connect and coordinate his/her work with theirs.

If any part of the Contractor's work depends, for proper execution or results, upon the work of any other contractor, the Contractor shall inspect and promptly report to the City Engineer any defects in such work that render it unsuitable for such proper execution and results. His/her failure to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his/her work, except as to defects which may develop in the other contractor's work after execution of his/her work.

110.11.00 USE OF PREMISES

City of Coburg shall furnish, as indicated in the Contract Documents and not later than the date when needed by Contractor, the lands upon which the work is to be done, rights-of-way for access thereto, and such other lands which are designated for the use of Contractor. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the City of Coburg, unless otherwise specified in the Contract Documents. If Contractor believes that any delay in City of Coburg furnishing these lands or easements entitles him/her to an extension of the Contract Time, he may make claim therefore. The Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

The Contractor shall confine his/her equipment, the storage of materials, and the operation on his/her workmen to limits shown on the plans or indicated by law, ordinances, permits, or directions of the City Engineer, and shall not unreasonably encumber the premises with his/her materials.

110.12.00 USE OF COMPLETED PORTIONS

The City of Coburg shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding the time for completing the entire work or such portions, which may not have expired. Such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of the work, or delays the completion of the work, the Contractor shall be entitled to extra compensation or an extension of time, or both. Should such condition or conditions prevail, the Contractor shall submit his/her claim for additional compensation or extension of time, in writing, to the City Engineer. The City Engineer will review the claim and determine its validity.

110.13.00 CUTTING AND PATCHING

The Contractor shall do all cutting, fitting, or patching of his/her work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown upon or reasonably implied by the plans.

110.14.00 CLEANING UP

Cleaning up shall be a continuing process from the start of work to final acceptance of the project. The Contractor shall, at all times, at his/her own expense and without further order keep property on which work is in progress free from accumulations of waste material or rubbish caused by employees or by the work, and at all times during the construction period shall maintain structure sites, rights-of-way, adjacent property, and the surfaces of streets and roads on which work is being done in a safe condition for the Contractor's workers, and the public. Accumulation of waste materials that might constitute a fire hazard will not be permitted. Spillage from the Contractor's hauling vehicles on traveled public or private roads and parking areas shall be promptly cleaned up. Upon completion of the construction, the Contractor shall, at his/her own expense, remove all temporary structures, rubbish, and waste materials resulting from his/her operations.

Upon failure of the Contractor to provide cleanup within 24 hours of being so directed by the Engineer in writing, the City, or an agent retained by the City, may complete the cleanup and the cost thereof plus 10% for handling shall be deducted from any payment due the Contractor.

110.15.00 CHANGES IN QUANTITY

The City of Coburg reserves the right to increase or decrease quantities without limit or to omit portions of the work without invalidating said proposal or re-negotiating the unit bid price.

110.16.00 PERFORMANCE TESTING

Operating equipment and systems shall be performance tested in the presence of the City Engineer to demonstrate compliance with the specified requirements. Performance testing shall be conducted under the specified design operation conditions or under such simulated operating conditions as recommended or approved by the City Engineer. Such testing shall be scheduled with the City Engineer at least one (1) week in advance of the planned date for testing and include a factory representative on site.

110.17.00 SUBSTANTIAL COMPLETION DATE

The City Engineer may, at his/her sole discretion, issue a written notice of substantial completion for the purpose of establishing the starting date for specific guarantees, and to establish the date that the City of Coburg will assume the responsibility for the cost of operating such portions of the project. Said notice shall not be considered as final acceptance of any portion of the work or relieve the Contractor from completing the remaining work within the specified time and in full compliance with the Contract Documents. All equipment contained in the work, plus all other components necessary to enable the City of Coburg to operate the facility in the manner that was intended, shall be complete including acceptable testing as specified in these Contract Documents on the substantial completion date.

The City of Coburg shall have the right to exclude Contractor from the project after the date of substantial completion, but City of Coburg shall allow Contractor reasonable access to complete or correct remaining items of work.

111 PAYMENT

111.1.00 BASIS OF PAYMENT

In consideration of the faithful performance of all the covenants, stipulations, and conditions in these Contract Documents, the City of Coburg will agree to pay the Contractor in the amount bid as adjusted when so stipulated in the Contractor's Proposal on the basis of the unit prices named in the Contractor's Proposal for the work actually performed as determined by the final estimate of the City Engineer, together with any amounts due for extra work not classified under the items listed in the Contractor's Proposal – See Contract terms and conditions

111.2.00 CHANGE ORDERS

Payment or credit for any alterations covered by a Change Order shall be determined by one or a combination of methods set forth in 111.3.03,

111.2.01 UNIT PRICES

If applicable, those unit prices stipulated in the Proposal or unit prices negotiated and mutually acceptable to the Contractor and City of Coburg.

111.2.02 LUMP SUM

A total sum for the work negotiated and mutually acceptable to the Contractor and City of Coburg. may be submitted to the City of Coburg in accordance with 111.2.00 and 111.2.01 Contractor's quotations for Change Orders shall be in writing and firm for a period of forty-five (45) days. Any compensation agreed upon, and subsequently paid by the City of Coburg for work defined in a Change Order shall be deemed to include all costs and expenses related to such work, including the costs and expenses to a direct, indirect, and consequential nature, or otherwise, and it is specifically understood and agreed that no additional compensation may be subsequently sought or charged by the Contractor for the work covered by the applicable Change Order.

The City of Coburg's request for quotations on alterations to the work shall not be considered authorization to proceed with the work prior to the issuance of a formal Change Order, nor shall such request justify any delay in existing work.

111.3.03 FORCE ACCOUNT WORK

If the method of payment cannot be agreed upon prior to the beginning of the work, and the City of Coburg or the City Engineer directs that the work be done by written Change Order or on a force account basis, then the Contractor shall furnish labor, equipment, and materials necessary to complete the work in a satisfactory manner and within a reasonable period of time. For the work performed, payment will be made for the documented actual cost of the following:

- **Labor**, including foremen, who are directly assigned to the force account work: (actual payroll cost, including wages, fringe benefits as established by negotiated labor agreements, labor insurance and labor taxes as established by law). No other fixed labor burden will be considered unless approved in writing by the City of Coburg.

- **Material** delivered and used on the designated work, including sales tax, if paid for by Contractor or his/her Subcontractor.
- **Rental** or equivalent rental cost of equipment, including necessary transportation for items having a value in excess of one hundred dollars (\$100). The current Associated General Contractors of America published equipment rental rates will be the maximum allowable rate.
- Additional **bond**, as required and approved by the City of Coburg.
- Additional **insurance** (other than labor insurance) as required and approved by the City of Coburg.

To costs under 111.3.03 FORCE ACCOUNT WORK, there shall be added the following fixed fees for the Contractor or Subcontractor actually performing the work:

A fixed fee of **fifteen percent (15%)** added to the cost of **labor, materials and rentals**; and

A fixed fee of **six percent (6%)** added to the cost of **bonds and insurance** above.

An additional fixed fee of **ten percent (10%)** shall be allowed the Contractor for the **administrative handling** of portions of the work that are performed by an Approved **Subcontractor**. No additional fixed fee will be allowed for the administrative handling of work performed by a Subcontractor of a Subcontractor unless by written permission from the City of Coburg.

The added fixed fees shall be considered to be full compensation, covering the cost of general supervision, overhead, profit, and any other general expense.

The City of Coburg reserves the right to furnish such materials and equipment, as it deems expedient, and the Contractor shall have no claim for profit or added fees on the cost of such materials and equipment.

For equipment that is rented as specified above, rental or equivalent rental cost will be allowed for only those days or hours during which the equipment is in actual use. Rental and transportation allowances shall not exceed the current rental rates prevailing in the locality. The rentals allowed for equipment will, in all cases, be understood to cover all fuel, supplies, repairs, and renewals, and no further allowances will be made for those items, unless specific agreement to that effect is made.

The Contractor shall maintain his/her records in such a manner as to provide a clear distinction between the direct costs of work paid for on a force account basis and the costs of other operations. The Contractor shall furnish the City Engineer report sheets in duplicate of each day's force account work no later than the working day following the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, Subcontractor, or other forces. The daily report sheets shall provide names or identifications and classifications of workers, the hourly rate of pay and hours worked, and also the size, type, and identification number of equipment and hours operated.

Material charges shall be substantiated by valid copies of vendor's invoices for materials used in the alterations covered by Change Orders. Such invoices shall be submitted with the daily report sheets, or, if not available, they shall be submitted with subsequent daily report sheets. Said daily report sheets shall be signed by the Contractor or his/her authorized agent.

To receive partial payments and the final payment for force account work, the Contractor shall submit in a manner approved by the City Engineer, detailed and complete documented verification of the Contractor's and any of his/her Subcontractor's actual current costs involved in the force account work pursuant to the issuance of an approved Change Order. Such costs shall be submitted within thirty (30) days after said work has been performed.

No payment will be made for work billed and submitted to the City Engineer after the thirty (30) day period has expired. No extra or additional work shall be performed by the Contractor, except in an emergency endangering life or property, unless in pursuance of a written Change Order.

111.4.00 CLAIMS

If the Contractor claims that any instructions involve extra cost under this Agreement, he/she shall give the City Engineer and the City of Coburg written notice thereof within forty-eight (48) hours after the receipt of such instructions, and in any event before proceeding to execute the work. If such notification is not given, or if the City Engineer is not afforded proper facilities by the Contractor for keeping strict account of actual cost, then the Contractor hereby agrees to waive the claim for such additional compensation. Such notice by the Contractor, and the fact that the City Engineer has kept account of the cost as aforesaid, shall not in any way be construed as proving the validity of the claim. Claims for additional compensation shall be made in itemized detail and submitted, in writing, to the City of Coburg and City Engineer within ten (10) days following completion of that portion of the work for which the Contractor bases his/her claim is found to be just. It shall be allowed and paid for as provided in the section covering Change Orders.

Engineer's decision regarding claims: Engineer will render a formal decision in writing 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. Engineer's written decision on such Claim, dispute, or other matter will be final and binding upon Owner and Contractor unless: an appeal from Engineer's decision is taken with the time limits. A written notice of intention to appeal against the Engineer's written decision will follow the formal requirements of Section 00199.40 of the 2021 Oregon Standard Specifications.

111.5.00 FINAL PAYMENT

To receive final payment, the Contractor must do the following:

- Notify the City Engineer, in writing, that he/she has completed his/her work in accordance with the Contract Documents and request final payment.
- Submit to the City of Coburg appropriate waivers of lien for itself and all Subcontractors and a signed affidavit, satisfactory to the City of Coburg, stating that so far as he/she has knowledge or information, all accounts for materials, labor, and incidentals in connection with the work have been paid in full.
- On agreements for public works, furnish to the City of Coburg a completed wage certification as required by ORS 279, as amended.

Within fifteen (15) days of written notice from the Contractor that the work has been completed, the City Engineer shall conduct a final inspection of the work. If the work has been completed to the satisfaction of the City Engineer, he/she shall submit a certificate of acceptance of the completed work, together with a final estimate of the amount due the Contractor under this Agreement, less any amount to be withheld by the City of Coburg to ensure guarantees.

The City of Coburg shall, within thirty (30) days, pay to the Contractor all monies due him/her under the conditions of the Agreement upon the following:

- The City of Coburg's acceptance of the City Engineer's final estimate.
- The City of Coburg's approval of the affidavit/affidavits of the release of any and all liens.
- The receipt of all required wage certifications
- Certification by Contractor that all suppliers and subcontractors have been paid.
- Inspection and approval by all or any concerned public works of the State, of any County, Municipality or political subdivision created by law, or Public Utility.

111.6.00 MATERIALS DELIVERED TO THE WORK SITE BUT NOT USED

Final payment will be made only for materials actually incorporated in the work. Upon acceptance of the work, all materials stored on the site, unless otherwise agreed upon in writing, shall revert to the Contractor.

111.7.00 ACCEPTANCE OF FINAL PAYMENT

The acceptance by the Contractor of the final payment shall release the City of Coburg and the City Engineer as agent of the City of Coburg from all claims and all liability to the Contractor for all things done or furnished in connection with the work, and every act of the City of Coburg and others relating to or arising out of the work. No payment, however, final or otherwise, shall operate to release the Contractor from obligations under these Contract Documents.

Section 420
Supplementary General Conditions

**Section 00420
SUPPLEMENTARY GENERAL CONDITIONS
To The
GENERAL CONDITIONS OF THE CONTRACT**

Contract No. _____
PROJECT NAME CITY OF COBURG OPERATIONS BUILDING AND OPERATIONS STORAGE BUILDING PROJECT

For the above contract, the following supplements modify the General Conditions of the Contract Documents. Where a portion of the General Conditions is modified or deleted by these Supplemental General Conditions, the unaltered portions of the General Conditions shall remain in effect.

SECTION 103-THE CITY ENGINEER

Add the following:

103.1.01 CONTRACT CITY ENGINEER

The City Engineer for the purposes of this contract shall be:

Branch Engineering
310 5th Street
Springfield, OR 97447
ATTN: Julie Leland, P.E.
541-746-0637

SECTION 105- OREGON LAW – CIVIL RIGHTS – WAGE LAWS

105.0.02 Oregon State Environmental Requirements

Add the following

Additionally, if contractor encounters cultural or archaeological materials during the course of work, work shall be immediately shut down until a professional archaeologist can be notified for an inspection. The contractor shall notify the local tribes of ongoing work and immediately notify the tribes of any potential archaeological material.

105.05 BUREAU OF LABOR & INDUSTRIES (BOLI) & DAVIS BACON PREVAILING WAGE LAWS

Add the following:

Prevailing wage rates are located here:
http://www.oregon.gov/boli/WHD/PWR/Pages/pwr_state.aspx

Use the most current Prevailing Wage Rates for Public Contracts in Oregon document including any amendments to the prevailing rates at time of contract initiation.

SECTION 109 CONTRACT LEGALITIES

Add the following:

Contractor shall be responsible for complying with all permits and applications already obtained and acquire any remaining permits necessary to perform Work. This includes obtaining permits and providing

all required fees, bonds, insurance, or other items as may be reasonably be required by permitting agencies at no additional cost.

END OF SECTION

Section 500
STANDARD SPECIFICATIONS

SECTION 500
CITY OF COBURG
STANDARD SPECIFICATIONS

The Standard Specifications applicable to work on this project and the performance thereof, are those included in section 700 of this document and all applicable Building Specialty Codes currently adopted by the State of Oregon.

For sanitary sewer work of the project construction, if any, DEQ requires that in addition to the above specification, current DEQ Rules and Specifications will apply, and if a conflict is noted, the more stringent specification will apply. DEQ specifications are the Oregon Standard Specifications for Construction, 2021 edition.

Such Standard Specifications by this reference shall be deemed incorporated herein and made a part hereof as those fully set forth.

END OF SECTION

Section 600
SPECIAL SPECIFICATIONS

SECTION 600

Description, Measurement and Payment of Bid Items City of Coburg Operations Building and Operations Storage Building

All number references in these Special Provisions shall be understood to refer to the bid schedule item number as shown in Section 220 of this document.

1. MOBILIZATION, BONDS, AND INSURANCE

Payment for mobilization will be made at the Contract lump sum amount for Bid Item 1.

The amounts paid for mobilization in the Contract progress payment will be based on the percent of the original Contract Amount that is earned from other Contract items, not including advances on Materials, and as follows:

- When 5 percent is earned, either 50 percent of the amount for mobilization or 5 percent of the original Contract Amount, whichever is the least.
- When 10 percent is earned, either 100 percent of mobilization or 10 percent of the original Contract Amount, whichever is the least.
- When all Work is completed, amount of mobilization exceeding 10 percent of the original Contract Amount.

This schedule of mobilization progress payments will not limit or preclude progress payments otherwise provided by the Contract.

When the Contract Schedule of Items does not indicate payment for mobilization, no separate or additional payment will be made for mobilization. Payment will be included in payment made for the appropriate items under which this Work is required.

2. AUTHORIZED ADDITIONAL EXCAVATION

The quantities of Authorized Additional Excavation will be measured on the volume basis in cubic yards of Subgrade excavated to the depth as directed by the Engineer. The volume will be determined by horizontal and vertical measurements.

The accepted quantities of Authorized Additional Excavation will be paid for at the Contract unit price, per square yard, for the item "Authorized Additional Excavation".

Payment will be payment in full for furnishing and placing all Materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

No separate or additional payment will be made for excavation, geosynthetic, stone embankment or aggregate backfill material, or water.

3. 3/4"-0 AGGREGATE BASE

The accepted quantities of aggregates will be paid for at the Contract unit price, per unit of measurement for 3/4"-0 aggregate base.

Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

No separate or additional payment will be made for water used to obtain proper compaction and in the care of the work.

The total thickness of the Gravel Paving section detail in the Base Bid is incidental to this item. Excavation required for aggregate base installation is incidental to this bid item.

4. BUILDING #1 (COMPLETE)

The measurement unit for this work is lump sum.

The lump sum price for payment shall be as specified in the bid schedule (Item No. 4) submitted by the Contractor for this project.

The lump sum bid price shall be full compensation for all labor, materials, and equipment used to construct the following:

- Building structure including building pad, foundation, and all items and work required to erect and complete the structure Building #1 in accordance with the plans and specifications that are not previously covered by other bid items are incidental to this item.
- All utilities within 5' of the building and in accordance with the plans and specifications.
- Excavation required for building pad installation is incidental to this bid item.

5. BUILDING #2 (COMPLETE)

The measurement unit for this work is lump sum.

The lump sum price for payment shall be as specified in the bid schedule (Base Bid Item No. 5) submitted by the Contractor for this project.

The lump sum bid price shall be full compensation for all labor, materials, and equipment used to construct the following:

- Building structure including building pad, foundation, and all items and work required to erect and complete the structure Building #2 in accordance with the plans and specifications that are not previously covered by other bid items are incidental to this item.
- All utilities within 5' of the building and in accordance with the plans and specifications.
- Excavation required for building pad installation is incidental to this bid item.

6. ELECTRICAL (COMPLETE)

The measurement unit for this work is lump sum.

The lump sum price for payment shall be as specified in the bid schedule (Base Bid Item No. 6) submitted by the Contractor for this project

The lump sum bid price shall be full compensation for all labor, materials, and equipment used to construct the following:

- Electrical conduit lines and trenches for both buildings in accordance with the electrical plans and specifications installed to within 5' of each building.

7. WATER (COMPLETE)

The measurement unit for this work is lump sum.

The lump sum price for payment shall be as specified in the bid schedule (Base Bid Item No. 7) submitted by the Contractor for this project.

The lump sum bid price shall be full compensation for all labor, materials, and equipment used to construct the following:

- Service line to within 5' of Building #1 and connection to existing water tap in accordance with the plans and specifications.
- New Water Meter and Double Check Detector and Backflow Assembly in accordance with the plans and specifications.

8. STORMWATER (COMPLETE)

The measurement unit for this work is lump sum.

The lump sum price for payment shall be as specified in the bid schedule (Base Bid Item No. 8) submitted by the Contractor for this project.

The lump sum bid price shall be full compensation for all labor, materials, and equipment used to construct the following:

- French Drain installation and connection to existing stormwater swale in accordance with the plans and specifications.

9. 4" THICK CONCRETE WALKWAY

The measurement unit for this work is square feet of the finished surface. Measurement of concrete walks will include the total area of concrete walk.

All necessary work and materials required to construct the aggregate base in accordance with the plans and specifications for concrete walkway areas shall be incidental to this item.

10. 3' WIDE, 6" THICK REINFORCED CONCRETE WALKWAY

The measurement unit for this work is square feet of the finished surface. Measurement of reinforced concrete walk will include the total area of concrete walk.

All necessary work and materials required to construct the aggregate base and reinforcement in accordance with the plans and specifications shall be incidental to this item.

11. 6" THICK CONCRETE ADA PARKING STALL

The measurement for this work is square feet of the finished surface. Measurement of reinforced concrete walk will include the total area of concrete parking.

All necessary work and materials required to construct the aggregate base in accordance with the plans and specifications shall be incidental to this item.

12. CONSTRUCTION STAKING

The measurement for this work is lump sum. All necessary work and materials required to provide construction survey work according to the current edition on the date of Advertisement, of the ODOT "Construction Surveying Manual for Contractors" found at https://www.oregon.gov/odot/ETA/Documents_Geometronics/Construction-Survey-Manual-Contractors.pdf is incidental to this item.

13. SIGNING AND STRIPING (COMPLETE)

The measure for this work is lump sum. All necessary work and materials required to provide signing and striping as shown on the plans is incidental to this bid item.

A1.1 8" THICK, REINFORCED CONCRETE VALLEY GUTTER

The measurement for this work is Lineal Feet. Measurement will be on the length of finished surface and will include the total length of concrete valley gutter as measured from the flow line.

All necessary work and materials required to construct the aggregate base and reinforcement in accordance with the plans and specifications shall be incidental to this item.

A1.2 4" OF LEVEL 2, 1/2" DENSE HMAC

The measurement for this work is on the weight basis in Tons. No deductions will be made for asphalt cement, mineral filler, lime, anti-strip, or any other additive used in the mixture.

The accepted quantities will be paid for at the Contract unit price, per ton, for this item. Payment will be payment in full for furnishing and placing all materials, and for furnishing all equipment and labor necessary to complete the work as specified.

Aggregate will be paid for according to Item 3.

A1.3 4" THICK CONCRETE WALKWAY

The measurement unit for this work is square feet of the finished surface. Measurement of concrete walks will include the total area of concrete walk.

Aggregate will be paid for according to Item 3.

A1.4 6" THICK, REINFORCED CONCRETE DRIVEWAY APRON

The measurement unit for this work is square feet of the finished surface. Measurement of this item will include the total area of concrete driveway.

All necessary work and materials required to construct the reinforcement in accordance with the plans and specifications for concrete driveway apron areas shall be incidental to this item.

Aggregate will be paid for according to Item 3.

A2.1 3/4"-0 AGGREGATE FOR ADDED GRAVEL PAVING

The measurement unit for this work is on the weight basis in Tons.

Payment will be payment in full for furnishing and placing all Materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

No separate or additional payment will be made for water used to obtain proper compaction and in the care of the work.

The aggregate in this section includes the additional thickness of gravel not covered in the base bid for the gravel paving section which surrounds the building as shown in the plans.

A2.2 3' WIDE, 4" THICK CONCRETE WALKWAY

The measurement unit for this work is square feet of the finished surface. Measurement of concrete walks will include the total area of concrete walk.

Payment will be payment in full for furnishing and placing all Materials, and for furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

Aggregate will be paid for according to Item 3.

A2.3 RAISE BUILDING #1 FFE 6"

The measurement unit for this work is lump sum.

The lump sum price for payment shall be as specified in the bid schedule (A2.3 Raise Building #1 FFE) submitted by the Contractor for this project.

The lump sum bid price shall be full compensation for all labor, materials, and equipment used to construct the following:

- All additional crushed aggregate required for building pad and gravel paving areas where gravel thickness is affected by a 6" raised finished floor elevation as shown and in accordance with the plans and Geotechnical recommendations.

**Section 700
CSI SPECIFICATIONS**

SECTION 030130 - MAINTENANCE OF CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Floor joint repair.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.
- B. Store cementitious materials off the ground, under cover, and in a dry location.
- C. Store aggregates covered and in a dry location; maintain grading and other required characteristics and prevent contamination.

1.4 FIELD CONDITIONS

- A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.
 - 1. Use only Class A epoxies when substrate temperatures are below or are expected to go below **40 deg F** within eight hours.
 - 2. Use only Class A or B epoxies when substrate temperatures are below or are expected to go below **60 deg F** within eight hours.
 - 3. Use only Class C epoxies when substrate temperatures are above and are expected to stay above **60 deg F** for eight hours.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. For repair products, obtain each color, grade, finish, type, and variety of product from single source and from single manufacturer with resources to provide products of consistent quality in appearance and physical properties.

2.2 JOINT FILLER

- A. Epoxy Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A Shore durometer hardness of at least 80 according to ASTM D2240.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ChemCo Systems, Inc.
 - b. Dayton Superior Corporation
 - c. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - d. Metzger/McGuire
 - e. Sika Corporation
- B. Polyurea Joint Filler: Two-component, semirigid, 100 percent solids, polyurea resin with a Type A Shore durometer hardness of at least 80 according to ASTM D2240.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ARDEX Americas
 - b. ChemCo Systems, Inc.
 - c. Euclid Chemical Company (The); a subsidiary of RPM International, Inc.
 - d. Metzger/McGuire
- C. Color: match slab-on-grade, as approved by Owner.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Saw-cut joints as soon after pour as possible to depth as indicated in Drawings. Clean out debris and loose concrete; vacuum or blow clear with compressed air.
- B. Apply stain prevention film as indicated in Drawings.

3.2 FLOOR-JOINT REPAIR

- A. Depth: Install joint filler to a depth of at least 1 inch. Use fine silica sand no more than **1/4 inch** deep to close base of joint. Do not use sealant backer rods or compressible fillers below joint filler.
- B. Top Surface: Install joint filler so that when cured, it is flush at top surface of adjacent concrete. If necessary, overfill joint and remove excess when filler has cured.

END OF SECTION 030130

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Steel reinforcement bars.
- B. Related Requirements:
 - 1. Section 321313 "Concrete Paving" for reinforcing related to concrete pavement and walks.

1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Each type of steel reinforcement.
- B. Shop Drawings: Comply with ACI SP-066:
 - 1. Include placing drawings that detail fabrication, bending, and placement.
 - 2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
 - 1. Location of construction joints is subject to approval of Architect.

1.3 INFORMATIONAL SUBMITTALS

- A. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Steel Reinforcement:
 - a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
 - 1. Store reinforcement to avoid contact with earth.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

2.2 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions:
 - 1. Do not cut or puncture vapor retarder, where occurring.
 - 2. Repair damage and reseal vapor retarder before placing concrete, where occurring.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
 - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
 - 2. Do not tack weld crossing reinforcing bars.
- C. Preserve clearance between bars of not less than **1 inch**, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is

greater.

- D. Provide concrete coverage in accordance with **ACI 318** and as indicated in Drawings
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
 - 1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or **24 inches**, whichever is greater.
 - 2. Stagger splices in accordance with **ACI 318**.

3.3 JOINTS

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.
 - 1. Place joints perpendicular to main reinforcement.
 - 2. Continue reinforcement across construction joints unless otherwise indicated.
 - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.

3.4 INSTALLATION TOLERANCES

- A. Comply with **ACI 117**.

3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector, and, qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
 - 1. As indicated in Drawings.

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Concrete standards.
 2. Concrete materials.
 3. Repair materials.
 4. Concrete mixture materials.
 5. Concrete mixture class types.
 6. Concrete mixing.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement or blended hydraulic cement alone or in combination with one or more of the following:
1. Fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. Water/Cementitious Materials (w/cm) Ratio: The ratio by weight of mixing water to cementitious materials.

1.3 ACTION SUBMITTALS

- A. Product Data:
1. For each type of product indicated.
- B. Design Mixtures: For each concrete mixture, include the following:
1. For each concrete mixture.
- C. Shop Drawings:
1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - a. Location of construction joints is subject to approval of the Architect.
 2. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following:
 - 1. For all materials.
- B. Material Test Reports: For the following:
 - 1. For all materials.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified Installer who employs Project personnel , Concrete Flatwork Finisher, and a supervisor who have a minimum of 5 years of experience installing and finishing concrete for similar projects.
- B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
- C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing that performs duties on behalf of the Architect/Engineer.
- D. Field Quality-Control Testing Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
 - 1. Include the following information in each test report:
 - a. Admixture dosage rates.
 - b. Slump.
 - c. Air content.
 - d. Seven-day compressive strength.
 - e. 28-day compressive strength.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and **ACI 301**.

1.8 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with **ACI 301** as follows:

1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
2. When air temperature has fallen to, or is expected to fall below **40 deg F** during the protection period, maintain delivered concrete mixture temperature within the temperature range required by **ACI 301**.
3. Do not use frozen materials or materials containing ice or snow.
4. Do not place concrete in contact with surfaces less than **35 deg F**, other than reinforcing steel.

B. Hot-Weather Placement: Comply with **ACI 301** and **ACI 305.1**, and as follows:

1. Maintain concrete temperature at time of discharge to not exceed 95 deg F.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE STANDARDS

- #### A. ACI Publications: Comply with **ACI 301** unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I, Type II, gray.
2. Blended Hydraulic Cement: ASTM C595/C595M, Type IS, portland blast-furnace slag cement.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.

C. Normal-Weight Aggregates:

1. Coarse Aggregate: ASTM C33/C33M, Class 3M

2. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
3. Fine Aggregate: ASTM C33/C33M.

2.3 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C260/C260M.
- B. Chemical Admixtures: Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.
 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 2. Retarding Admixture: ASTM C494/C494M, Type B.
 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
 6. Admixtures with special properties, with documentation of claimed performance enhancement, ASTM C494/C494M, Type S.
- C. Mixing Water for Concrete Mixtures and Water Used to Make Ice: ASTM C1602/C1602M. Include documentation of compliance with limits for alkalis, sulfates, chlorides, or solids content of mixing water from Table 2 in ASTM C1602/C1602M.

2.4 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately **9 oz./sq. yd.** when dry.
- B. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.
 1. Color:
 - a. Ambient Temperature Below 50 deg F (10 deg C): Black.
 - b. Ambient Temperature between 50 and 85 deg F (10 and 29 deg C): Any color.
 - c. Ambient Temperature Above 85 deg F (29 deg C): White.
- D. Water: Potable water that does not cause staining of the surface.
- E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.5 ACCESSORIES

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.

2.6 CONCRETE MIXTURE MATERIALS

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with **ACI 301**.
 - 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
 - 1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Maximum Water-Cementitious Materials Ratio: as indicated on Drawings
 - 3. Slump Limit: as indicated on Drawings.
 - 4. Air Content: 6% +/- 1.5% for concrete exposed to freezing.

2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and furnish delivery ticket.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
 - 1. Before placing concrete, verify that installation of concrete forms, accessories, reinforcement, and embedded items is complete and that required inspections have been performed.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 TOLERANCES

- A. Comply with **ACI 117**.

3.4 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.5 INSTALLATION OF CAST-IN-PLACE CONCRETE

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Engineer and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
 1. If a section cannot be placed continuously, provide construction joints as indicated.
 2. Deposit concrete to avoid segregation.
 3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with **ACI 301**.

- a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least **6 inches** into preceding layer.
 - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
 - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Do not place concrete floors and slabs in a checkerboard sequence.
 2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 3. Maintain reinforcement in position on chairs during concrete placement.
 4. Screed slab surfaces with a straightedge and strike off to correct elevations.
 5. Level concrete, cut high areas, and fill low areas.
 6. Slope surfaces uniformly to drains where required.
 7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
 8. Do not further disturb slab surfaces before starting finishing operations.

3.6 INSTALLATION OF JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.
1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
 2. Place joints perpendicular to main reinforcement.
 - a. Continue reinforcement across construction joints unless otherwise indicated.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Sawn Joints: Form control joints with power saws equipped with

shatterproof abrasive or diamond-rimmed blades. Cut **1/8-inch** wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.

3.7 APPLICATION OF FINISHING FLOORS AND SLABS

A. Scratch Finish:

1. While still plastic, texture concrete surface that has been screeded and bull-floated or darbied.
2. Use stiff brushes, brooms, or rakes to produce a profile depth of **1/4 inch** in one direction.
3. Apply scratch finish to surfaces to receive mortar setting beds for bonded cementitious floor finishes.

B. Trowel Finish:

1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
2. Continue troweling passes and restraighthen until surface is free of trowel marks and uniform in texture and appearance.
3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
4. Do not add water to concrete surface. Use of an approved finishing aid is acceptable.
5. Do not apply troweled finish to concrete, which has a total air content greater than 3 percent.
6. Apply a trowel finish to surfaces of slab-on-grade building foundations.

C. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with a fiber-bristle broom perpendicular to main traffic route.
2. Coordinate required final finish with Architect before application.

3.8 APPLICATION OF FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

1. ACI 301 (ACI 301M) Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
 - a. Patch voids larger than **1-1/2 inches** wide or **1/2 inch** deep.
 - b. Remove projections larger than **1 inch**.
 - c. Tie holes do not require patching.
 - d. Surface Tolerance: **ACI 117**, Class D.

- e. Apply to concrete surfaces for metal lap pan deck formed surfaces and those surfaces that are buried or covered with subsequent installed surfaces.

3.9 APPLICATION OF CONCRETE CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
 - 1. Comply with **ACI 301** for cold weather protection during curing.
 - 2. Comply with **ACI 301** and **ACI 305.1** for hot-weather protection during curing.
 - 3. Maintain moisture loss no more than **0.2 lb/sq. ft. x h**, calculated in accordance with ACI 305R, before and during finishing operations.
- B. Curing Unformed Surfaces: Comply with **ACI 308.1** as follows:
 - 1. Begin curing after finishing concrete.
 - 2. Interior Concrete Floors:
 - a. Floors to Receive Floor Coverings Specified in Other Sections: Contractor has option of the following:
 - 1) Absorptive Cover: As soon as concrete has sufficient set to permit application without marring concrete surface, install prewetted absorptive cover over entire area of floor.
 - a) Lap edges and ends of absorptive cover not less than **12 inches**.
 - b) Maintain absorptive cover water saturated, and in place, for duration of curing period, but not less than seven days.
 - 2) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least **12 inches**, and sealed by waterproof tape or adhesive.
 - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - b) Cure for not less than seven days.
 - 3) Ponding or Continuous Sprinkling of Water: Maintain concrete surfaces continuously wet for not less than seven days, utilizing one, or a combination of, the following not in cold weather:
 - a) Water.
 - b) Continuous water-fog spray.

- b. Floors To Receive Curing Compound:
 - 1) Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 2) Recoat areas subjected to heavy rainfall within three hours after initial application.
 - 3) Maintain continuity of coating, and repair damage during curing period.
 - 4) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

3.10 INSTALLATION OF JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month(s).
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least **2 inches** deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.11 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
 - 1. Testing agency to be responsible for providing curing facility for initial curing of strength test specimens on-site and verifying that test specimens are cured in accordance with standard curing requirements in ASTM C31/C31M.
 - 2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
 - 3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and **ACI 301**, including the following as applicable

to each test and inspection:

- 1) Project name.
 - 2) Name of testing agency.
 - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
 - 4) Name of concrete manufacturer.
 - 5) Date and time of inspection, sampling, and field testing.
 - 6) Date and time of concrete placement.
 - 7) Location in Work of concrete represented by samples.
 - 8) Date and time sample was obtained.
 - 9) Truck and batch ticket numbers.
 - 10) Design compressive strength at 28 days.
 - 11) Concrete mixture designation, proportions, and materials.
 - 12) Field test results of fresh concrete, including slump or slump flow, air content, temperature and density.
 - 13) Information on storage and curing of samples at the Project site, including curing method and maximum and minimum temperatures during initial curing period.
 - 14) Type of fracture and compressive break strengths at seven days and 28 days.
4. Provide a space and source of power or other resources for curing and access to test specimens by the testing agency.
- C. Delivery Tickets: comply with ASTM C94/C94M.
- D. Inspections:
1. As indicated in Drawings.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding **5 cu. yd.**, but less than **25 cu. yd.**, plus one set for each additional **150 cu. yd.** or fraction thereof.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing is to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C143/C143M:
 - a. One test at point of delivery for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests as needed.

3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete; .
 - a. One test for each composite sample when strength test specimens are cast, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C1064/C1064M:
 - a. One test hourly when air temperature is **40 deg F** and below or **80 deg F** and above, and one test for each composite sample when strength test specimens are cast.
5. Concrete Density: ASTM C138/C138M:
 - a. One test for each composite sample when strength test specimens are cast.
6. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and standard cure two sets of two **6 inches** by **12-inches** or **4-inch** by **8-inch** cylindrical specimens for each composite sample.
 - b. Cast, and field cure two sets of two standard cylindrical specimens for each composite sample.
7. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one set of two standard cured specimens at seven days and one set of two specimens at 28 days.
 - b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
 - c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests of standard cured cylinders equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than **500 psi** if specified compressive strength is **5000 psi**, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than **5000 psi**.
10. 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.

11. Additional Tests:
 - a. Testing and inspecting agency to 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 Engineer.
 - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
 - 1) Acceptance criteria for concrete strength to be in accordance with **ACI 301**, Section 1.7.6.3.
12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

3.12 PROTECTION

- A. Protect concrete surfaces as follows:
 1. Protect from petroleum stains.
 2. Diaper hydraulic equipment used over concrete surfaces.
 3. Prohibit vehicles from interior concrete slabs.
 4. Prohibit use of pipe-cutting machinery over concrete surfaces.
 5. Prohibit placement of steel items on concrete surfaces.
 6. Prohibit use of acids or acidic detergents over concrete surfaces.
 7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
 8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using floor slab protective covering.

END OF SECTION 033000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous framing and supports attached to Metal Grating Stairs.
2. Supports for overhead doors.

1.2 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Shop primers.
2. Shrinkage-resisting grout.

- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:

1. All metal fabrications.

1.4 INFORMATIONAL SUBMITTALS

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

shop primers, certifying that shop primers are compatible with topcoats.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- D. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.

2.2 FASTENERS

- A. Steel Bolts and Nuts: Regular hexagon-head bolts, **ASTM A307, Grade A**; with hex nuts, **ASTM A563**; and, where indicated, flat washers.
- B. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, **ASTM A563**; and, where indicated, flat washers.
1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

- C. Anchors, General: Capable of sustaining, without failure, a load equal to six

times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.

- D. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.
- E. Post-Installed Anchors: .
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, **ASTM F593**, and nuts, **ASTM F594**.

2.3 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- B. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately **1/32 inch** unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, **1/8 by 1-1/2 inches**, with a minimum **6-inch** embedment and **2-inch** hook, not less than **8 inches** from ends and corners of units and **24 inches** o.c., unless otherwise indicated.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

2.6 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.7 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
 2. Galvanize those portions of the metal fabrication which are exterior, in direct contact with concrete, or exposed to view with no other specified finishes.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
1. Shop prime with universal shop primer unless zinc-rich primer is indicated.
 2. Shop prime only those portions of the metal fabrication which are interior, not in direct contact with concrete, and are not exposed to view.
- C. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Cast Aluminum: Heavy coat of bituminous paint.
 - 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for overhead doors securely to, and rigidly brace from, building structure.
- C. Anchor steel beams to wood-framed walls as indicated in Drawings.

3.3 INSTALLATION OF MISCELLANEOUS STEEL TRIM

- A. Anchor to concrete construction to comply with manufacturer's written instructions.

3.4 REPAIRS

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum **2.0-mil** dry film thickness.
 - 2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099123 "Interior Painting."
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas

and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 055000

SECTION 055119 - METAL GRATING STAIRS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal grating stairs.

1.2 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs, railings, and guards.
 - 1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
 - 2. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.
- D. Schedule installation of railings and guards so wall attachments are made only to completed walls.
 - 1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

1.3 ACTION SUBMITTALS

- A. Product Data: For metal grating stairs and the following:
 - 1. Gratings.
 - 2. Woven-wire mesh.
 - 3. Welded-wire mesh.
 - 4. Shop primer products.
 - 5. Grout.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachment to other work.
2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
3. Include plan at each level.
4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification.
1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
 2. Protect steel members and packaged materials from corrosion and deterioration.
 3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.
 - a. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 METALS

- A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Steel Bars for Grating Treads: ASTM A36/A36M or steel strip, ASTM

A1011/A1011M or ASTM A1018/A1018M.

D. Steel Wire Rod for Grating Crossbars: ASTM A510/A510M.

2.2 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls.

1. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, **ASTM A563**; and, where indicated, flat washers.

2.3 MISCELLANEOUS MATERIALS

A. Welding Electrodes: Comply with AWS requirements.

B. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20, ASTM A780/A780M and compatible with paints specified to be used over it.

D. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for interior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.

2.4 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, railings, guards, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

1. Join components by welding unless otherwise indicated.

2. Use connections that maintain structural value of joined pieces.

B. Assemble stairs, railings, and guards in shop to greatest extent possible.

1. Disassemble units only as necessary for shipping and handling limitations.

2. Clearly mark units for reassembly and coordinated installation.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately **1/32 inch** unless otherwise indicated.
 2. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. Weld exposed corners and seams continuously unless otherwise indicated.
 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #4 - Good quality, uniform undressed weld with minimal splatter.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
 2. Locate joints where least conspicuous.
 3. Fabricate joints that are exposed to weather in a manner to exclude water.
 4. Provide weep holes where water may accumulate internally.

2.5 FABRICATION OF STEEL-FRAMED STAIRS

- A. Stair Framing:
1. Fabricate stringers of steel channels.
 - a. Stringer Size: As indicated on Drawings.
 - b. Provide closures for exposed ends of channel stringers.
 - c. Finish: Galvanized.
 2. Construct platforms and tread supports of steel channel headers and miscellaneous framing members as indicated on Drawings.
 - a. Provide closures for exposed ends of channel framing.
 - b. Finish: Galvanized.
- B. Metal Bar-Grating Stairs: Form treads and platforms to configurations shown from metal bar grating; fabricate to comply with NAAMM MBG 531, "Metal Bar Grating Manual."

1. Fabricate treads and platforms from welded steel grating with openings in gratings no more than 5/16 inch in least dimension.
 - a. Surface: As indicated in Drawings.
 - b. Finish: Galvanized.
 2. Fabricate grating treads with cast-abrasive nosing and with steel angle or steel plate carrier at each end for stringer connections.
 - a. Secure treads to stringers as indicated in Drawings.
 3. Fabricate grating platforms with nosing matching that on grating treads.
- C. Risers: Open.
- D. Toe Plates: Provide toe plates around openings and at edge of open-sided floors and platforms, and at open ends and open back edges of treads.
1. Material and Finish: Steel plate to match finish of other steel items.
 2. Fabricate to dimensions and details indicated.

2.6 FINISHES

- A. Finish metal stairs after assembly.
- B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
1. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
 2. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.
1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.
- B. Proceed with installation only after unsatisfactory conditions have been

corrected.

3.2 INSTALLATION OF METAL STAIRS

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.
 - 1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
 - 1. Grouted Baseplates: Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces.
 - a. Clean bottom surface of baseplates.
 - b. Set steel-stair baseplates on wedges, shims, or leveling nuts.
 - c. After stairs have been positioned and aligned, tighten anchor bolts.
 - d. Do not remove wedges or shims, but if protruding, cut off flush with edge of bearing plate before packing with grout.
 - e. Promptly pack grout solidly between bearing surfaces and plates to ensure that no voids remain.
 - 1) Neatly finish exposed surfaces; protect grout and allow to cure.
 - 2) Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- D. Fit exposed connections accurately together to form hairline joints.
 - 1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
 - 2. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
 - 3. Comply with requirements for welding in "Fabrication, General" Article.

3.3 REPAIR

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material

as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

- a. Apply by brush or spray to provide a minimum **2.0-mil** dry film thickness.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 055119

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Steel railings and guards.

1.2 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

- A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Product Test Reports: For tests on railings performed by a qualified testing agency, in accordance with ASTM E894 and ASTM E935.
- E. Research Reports: For post-installed anchors, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

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

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

2.2 STEEL RAILINGS

- A. Tubing: ASTM A500/A500M (cold formed)ASTM A500 Gr. B.
- B. Pipe: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
 - 1. Provide galvanized finish for exterior installations and where indicated.
- C. Plates, Shapes, and Bars: ASTM A36/A36M.

2.3 FASTENERS

- A. Fastener Materials:
 - 1. Hot-Dip Galvanized Railing Components: Type 304 stainless steel or hot-dip zinc-coated steel fasteners complying with ASTM A153/A153M or ASTM F2329/F2329M for zinc coating.
 - 2. Finish exposed fasteners to match appearance, including color and texture, of railings.

- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction.
- C. Fasteners for Interconnecting Railing Components:
 - 1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
 - 2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
- D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193.
 - 1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.
- B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint, complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- D. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- E. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout, complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.5 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage.
- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.

1. Clearly mark units for reassembly and coordinated installation.
 2. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately.
1. Remove burrs and ease edges to a radius of approximately **1/32 inch** unless otherwise indicated.
 2. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- F. Connections: Fabricate railings with welded connections unless otherwise indicated.
- G. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove flux immediately.
 4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 welds; ornamental quality with no evidence of a welded joint.
- H. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- I. Form changes in direction as follows:
1. As detailed.
 2. By flush bends, or, by inserting prefabricated flush-elbow fittings.
- J. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.
- K. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is **1/4 inch** or less.
- L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.
- M. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.6 STEEL AND IRON FINISHES

- A. Galvanized Railings:
1. Hot-dip galvanize steel railings, including hardware, after fabrication.
 2. Comply with ASTM A123/A123M for hot-dip galvanized railings.
 3. Comply with ASTM A153/A153M for hot-dip galvanized hardware.
 4. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
- B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION, GENERAL

- A. Perform cutting, drilling, and fitting required for installing railings.
1. Fit exposed connections together to form tight, hairline joints.
 2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
 3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
 4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 5. Set posts plumb within a tolerance of **1/16 inch in 3 feet**.
 6. Align rails so variations from level for horizontal members and variations

from parallel with rake of steps and ramps for sloping members do not exceed **1/4 inch in 12 feet**.

- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 - 1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- C. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

- A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.

3.4 CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780/A780M.

3.5 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 055213

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood products.
2. Wood-preservative-treated lumber.
3. Dimension lumber framing.
4. Miscellaneous lumber.

B. Related Requirements:

1. Section 061600 "Sheathing" for sheathing, subflooring, and underlayment.

1.2 DEFINITIONS

A. Dimension Lumber: Lumber of **2 inches nominal** size or greater but less than **5 inches nominal** size in least dimension.

B. Lumber grading agencies, and abbreviations used to reference them, include the following:

1. WCLIB: West Coast Lumber Inspection Bureau.
2. WWPA: Western Wood Products Association.

1.3 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS

A. Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade

lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
3. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content:

1. Boards: 19 percent.
2. Dimension Lumber: 19 percent for 2-inch nominal thickness or less; no limit for more than 2-inch nominal thickness unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWWPA U1, Use categories as follows:

1. UC1: Interior construction not in contact with ground or subject to moisture. Include the following items:
 - a. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

A. Load-Bearing Partitions by Grade: No. 2 grade.

1. Application: Exterior walls, and, interior load-bearing partitions.
2. Species:
 - a. Douglas fir-larch; WCLIB or WWPA.
 - b. Douglas fir-south; WWPA.
 - c. Douglas fir-larch (north); NLGA.

2.4 MISCELLANEOUS LUMBER

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

1. Blocking.
2. Nailers.
3. Furring.

B. Dimension Lumber Items: grade lumber of the following species:

1. Douglas fir-larch; WCLIB or WWP.

2.5 FASTENERS

- A. General: Fasteners are to be of size and type indicated and comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than **1-1/2 inches** into wood substrate.
 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or ASTM F2329.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193, or, ICC-ES AC308 as appropriate for the substrate.

2.6 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets:
 1. Closed-cell neoprene foam, **1/4 inch** thick, selected from manufacturer's standard widths to suit width of sill members indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

- D. Install sill sealer gasket to form continuous seal between sill plates and foundation walls or slab-on-grade.
- E. Install sill sealer gasket/termite barrier in accordance with manufacturer's written instructions at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- H. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- I. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. ICC-ES evaluation report for fastener.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach wood blocking to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.3 INSTALLATION OF WALL AND PARTITION FRAMING

- A. General: Provide single bottom plate and double top plates using members of **2-inch nominal** thickness whose widths equal that of studs.. Fasten plates to supporting construction unless otherwise indicated.
 - 1. For exterior walls, provide 2-by-4-inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.
 - 2. For interior partitions and walls, provide 2-by-4-inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.
- B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.
- C. Frame openings with multiple studs and headers. Provide header as indicated in Drawings. Support headers on jamb studs.

3.4 PROTECTION

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

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall sheathing.
 - 2. Floor sheathing (see Subflooring).
 - 3. Plywood dust cover (see Subflooring).
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry" .

1.2 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS

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

2.2 WALL SHEATHING

- A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, Exposure 1 sheathing.
 - 1. Nominal Thickness: Not less than as indicated in Drawings.
- B. Oriented-Strand-Board Sheathing: DOC PS 2, Exposure 1 sheathing.
 - 1. Nominal Thickness: Not less than as indicated in Drawings.

2.3 SUBFLOORING AND UNDERLAYMENT

- A. Plywood Combination Subfloor-Underlayment: DOC PS 1, Exposure 1, Underlayment single-floor panels.
 - 1. Span Rating: Not less than 48.
 - 2. Nominal Thickness: Not less than as indicated in Drawings.
 - 3. Edge Detail: Tongue and groove.
 - 4. Surface Finish: Fully sanded face A-C.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. Table 2304.10.1, "Fastening Schedule," in the ICC's International Building Code.
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 INSTALLATION OF WOOD STRUCTURAL PANEL

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

3.3 FIELD QUALITY CONTROL

- A. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- B. Prepare test and inspection reports.

END OF SECTION 061600

SECTION 061715 - ENGINEERED STRUCTURAL WOOD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural composite lumber.
2. Prefabricated wood I-joists.
3. Engineered rim boards.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for dimension lumber items associated with engineered structural wood.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data on adhesives, fabrication, and protection.
2. For connectors, include installation instructions.

1.3 INFORMATIONAL SUBMITTALS

A. Research Reports: For engineered structural wood, from ICC-ES.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store, stack, and handle engineered wood products to comply with recommendations of APA EWS E705.

1. Store wrapped or banded together until ready for installation, on level well-drained area. Do not store in direct contact with the ground. Use stickers to separate bundles, spaced as recommended in writing by manufacturer.
2. Store I-joists level with the webs vertically.

B. Do not stack other material on top of structural composite lumber or I-joists.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of engineered wood product from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
 - 1. Allowable design stresses, as published by manufacturer, are to meet or exceed those indicated. Manufacturer's published values are to be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.3 STRUCTURAL COMPOSITE LUMBER

- A. Laminated-Veneer Lumber (LVL): Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored in accordance with ASTM D5456, and manufactured with exterior-type adhesive complying with ASTM D2559.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Boise Cascade
 - b. RedBuilt
 - c. Weyerhaeuser Company
 - 2. Allowable Stresses:
 - a. Extreme Fiber Stress in Bending, Edgewise (F_b): 2600 psi for **12-inch nominal**- depth members.
 - b. Modulus of Elasticity, Edgewise (E): 2,000,000 psi.
 - c. Minimum Modulus of Elasticity (E_m): 1,016,535 psi.
 - d. Horizontal Shear (F_v): 285 psi.
 - e. Tension Parallel to Grain (F_t): 1895 psi.
 - f. Allowable Compression Stress, Parallel to the Grain (F_c): 2510 psi.
 - 3. Moisture Protection: Factory seal edge and ends with manufacturer's

standard water-resistant coating.

- B. Laminated-Strand Lumber (LSL): Structural composite lumber made from wood flake strands with grain primarily parallel to member lengths, evaluated and monitored in accordance with ASTM D5456, and manufactured with exterior-type adhesive complying with ASTM D2559.
1. Manufacturers: Subject to compliance with requirements, :
 - a. Weyerhaeuser Company
 2. Allowable Stresses:
 - a. Extreme Fiber Stress in Bending, Edgewise (F_b): 1700 psi for **12-inch nominal**- depth members.
 - b. Modulus of Elasticity, Edgewise (E): 147,000 psi.
 - c. Minimum Modulus of Elasticity (E_m): 1,300,000 psi.
 - d. Horizontal Shear (F_v): 425 psi.
 - e. Allowable Compression Stress, Parallel to the Grain (F_c): 1835 psi.

2.4 PREFABRICATED WOOD I-JOISTS

- A. Prefabricated Units: I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural webs, let into and bonded to flanges. Comply with material requirements of, and with structural capacities established and monitored in accordance with, ASTM D5055.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Boise Cascade
 - b. RedBuilt
 - c. Weyerhaeuser Company
 2. Flange Material: Laminated-veneer lumber.
 3. Web Material: OSB, Exposure 1.
 4. Structural Properties: Depths and design values not less than those indicated.
 5. Identification Marks:
 - a. Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist series, referenced standard (APA PRI-400) or APA Product Report number, and manufacturing plant number.
 - b. Factory mark I-joists with manufacturer's name, joist series, mill identification, manufacturing date and time, name of third-party

inspection agency, and ICC/CCMC code report number. Repeat identification marks at minimum **12 ft.** intervals.

2.5 ENGINEERED RIM BOARDS

- A. Prefabricated, structural panel complying with APA PRR 410, APA PRR 401, or ASTM D7672 for wood frame construction and research or evaluation report for I-joists.
 - 1. Manufacturer: Provide products by same manufacturer as I-joists.
 - 2. Material: OSB.
 - 3. Thickness: 1-1/2 inches.
 - 4. Identification Marks: Comply with APA PRR-401, rim board grade.
 - a. Factory mark rim board with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.
 - b. Factory mark rim boards with manufacturer's name, rim board series, mill identification, manufacturing date and time, name of third-party inspection agency, and ICC/CCMC code report number. Repeat identification marks at minimum **12 ft.** intervals.

2.6 FASTENERS

- A. General: Fasteners are to be of size and type indicated and to comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than **1-1/2 inches** into wood substrate.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Wood Screws and Lag Screws: ASME B18.2.1, ASME B18.6.1, or ICC-ES AC233.
- E. Carbon Steel Bolts: ASTM A307 with **ASTM A563** hex nuts and, where indicated, flat washers all hot-dip zinc coated.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Do not install in direct contact with concrete or masonry.

3.2 INSTALLATION OF STRUCTURAL COMPOSITE LUMBER

- A. Install to comply with ESR report, manufacturer's written instructions, and applicable code.
 - 1. Install in dry, covered conditions where average in-service moisture content of lumber is 16 percent or less.
 - 2. Install metal framing connections in accordance with AWC's "National Design Specification (NDS) for Wood Construction." Install fasteners through each fastener hole.
 - a. Connections based on NDS or manufacturer's test or code reports.
 - 3. Install lumber plumb and level. Accurately fit, align, securely fasten, and install free from distortion or defects.
 - 4. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.
- B. Cutting: Confirm size and location of field cutting, notching, and drilling with ESR report, registered design professional, and manufacturer.

3.3 INSTALLATION OF PREFABRICATED WOOD I-JOISTS

- A. Install to comply with ESR report, manufacturer's written instructions, and applicable code.
 - 1. Install in dry, covered conditions where in-service moisture content of wood does not exceed 16 percent.
 - 2. Install metal framing connections in accordance with AWC's "National Design Specification (NDS) for Wood Construction." Install fasteners through each fastener hole.
 - 3. Install joists with top and bottom flanges within **1/2 inch** of true vertical alignment, and support ends of each member with not less than **1-3/4 inches** for end bearing and **3-1/2 inches** for intermediate bearings.
 - 4. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.
 - 5. Provide lateral restraint at supports to prevent rotation, and along the compression flange of each joist.
 - 6. Completely install and properly nail hangers, rim joists, rim boards, blocking panels, and x-bracing as each joist is set.
- B. Cantilevered portions of joists must not exceed a maximum length equal to one-third the adjacent span, and support only uniform loads, unless designed by a design professional and approved by authorities having jurisdiction.
 - 1. Temporarily secure ends of cantilevers with strut lines on both top and bottom flanges. Remove only as required to install permanent sheathing.

- C. Cutting: Do not splice structural members between supports unless otherwise indicated.
 - 1. Do not cut, drill, or notch I-joist top and bottom flanges except for cutting to length.

3.4 INSTALLATION OF ENGINEERED RIM BOARDS

- A. Install at bearing walls perpendicular to and supported by I-joists that require full-depth blocking, or rim joists, at supports.

3.5 PROTECTION

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

END OF SECTION 061715

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber blanket insulation.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Glass-fiber blanket insulation.

1.3 INFORMATIONAL SUBMITTALS

- A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.
 - 1. Sign, date, and post the certification in a conspicuous location on Project site.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Labeling: Provide identification of mark indicating R-value of each piece of insulation **12 inches** and wider in width.
- B. Thermal-Resistance Value (R-Value): R-value as indicated on Drawings in

accordance with ASTM C518.

2.2 GLASS-FIBER BLANKET INSULATION

- A. Glass-Fiber Blanket Insulation, Unfaced: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed; SAINT-GOBAIN
 - b. Johns Manville; a Berkshire Hathaway company
 - c. Owens Corning

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Install insulation with manufacturer's R-value label exposed after insulation is installed.
- D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 3. Maintain **3-inch** clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 4. For wood-framed construction, install blankets in accordance with ASTM C1320 and as follows:
 - a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
 5. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
 - a. Exterior Walls: Set units with facing placed toward interior of construction.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately **2.5 lb/cu. ft.**
 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.4 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior standard steel doors and frames.
2. Exterior standard steel doors and frames.

B. Related Requirements:

1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.3 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.4 QUALITY ASSURANCE

- A. Fire-Rated Door Inspector Qualifications: Inspector for field quality-control inspections of fire-rated door assemblies is to meet the qualifications set forth in NFPA 80, Section 5.2.3.1 and the following:
1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.
- B. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies is to meet the qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:

1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum **4-inch**- high wood blocking. Provide minimum **1/4-inch** space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 HOLLOW METAL DOORS AND FRAMES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Airtec Corporation
 2. Apex Industries, Inc
 3. BARON Metal Industries, Inc.; ASSA ABLOY of Canada, Ltd.; ASSA ABLOY
 4. Ceco Door; AADG, Inc.; ASSA ABLOY
 5. Concept Frames, AADG, Inc.; ASSA ABLOY Group
 6. Curries, AADG, Inc.; ASSA ABLOY Group
 7. Custom Metal Products
 8. Daybar Industries, Ltd
 9. DCI Hollow Metal on Demand
 10. DE LA FONTAINE
 11. Deansteel Manufacturing Company, Inc.
 12. Deronde Products
 13. DKS Steel Door & Frame Systems, Inc.
 14. Fleming Door Products Ltd.; ASSA ABLOY Group
 15. Gensteel Doors
 16. HMF Express
 17. Hollow Metal Xpress
 18. JR Metal Frames, Inc.
 19. Karpen Steel Custom Doors & Frames

20. L.I.F. Industries, Inc
21. LaForce, LLC
22. MegaMet Industries
23. Mesker Door; Mesker Openings Group
24. Metropolitan Door Industries Corp.
25. Michbi Doors Inc
26. MPI Group, LLC (The)
27. National Custom Hollow Metal Doors & Frames
28. North American Door Corp
29. Philipp Manufacturing Co (The)
30. Pioneer Industries; AADG, Inc.; ASSA ABLOY
31. Premier Products, Inc
32. Republic Doors and Frames; a Allegion brand
33. Rocky Mountain Metals, Inc
34. Security Metal Products; a brand of ASSA ABLOY
35. Steelcraft; Allegion plc
36. Steward Steel, Door & Frame Division
37. Stiles Custom Metal, Inc
38. Titan Metal Products
39. Trillium Steel Doors Limited
40. West Central Manufacturing, Inc.

2.2 PERFORMANCE REQUIREMENTS

- A. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than as indicated in Drawings when tested in accordance with ASTM C1363 or ASTM E1423.

2.3 INTERIOR STANDARD STEEL DOORS AND FRAMES

- A. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. As indicated in Drawings for interior door locations.

1. Doors:
 - a. Type: As indicated in the Door and Frame Schedule on Drawings.
 - b. Thickness: **1-3/4 inches**.
 - c. Face: Uncoated steel sheet, minimum thickness of **0.042 inch**.
 - d. Edge Construction: Model 1, Full Flush.
 - e. Edge Bevel: Provide manufacturer's standard beveled or square edges.
 - f. Core: Manufacturer's standard.
2. Frames:
 - a. Materials: Uncoated steel sheet, minimum thickness of **0.053 inch**.

- b. Construction: Full profile welded.
- 3. Exposed Finish: Prime.

2.4 EXTERIOR STANDARD STEEL DOORS AND FRAMES

A. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A. as indicated in Drawings for exterior door locations.

1. Doors:

- a. Type: As indicated in the Door and Frame Schedule on Drawings.
- b. Thickness: **1-3/4 inches**.
- c. Face: Metallic-coated steel sheet, minimum thickness of **0.053 inch**, with minimum A40 coating.
- d. Edge Construction: Model 1, Full Flush.
- e. Edge Bevel: Provide manufacturer's standard beveled or square edges.
- f. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
- g. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
- h. Core: Manufacturer's standard.

2. Frames:

- a. Materials: Metallic-coated steel sheet, minimum thickness of **0.053 inch**, with minimum A40 coating.
- b. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.5 BORROWED LITES

- A. Fabricate of uncoated steel sheet, minimum thickness of 0.042 inch.
- B. Construction: Full profile welded.
- C. Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as metal as frames.
- D. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2.6 HOLLOW-METAL PANELS

- A. Provide hollow-metal panels of same materials, construction, and finish as adjacent door assemblies.

2.7 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
 - 2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each **24 inches** of frame height above **7 feet**.
 - 3. Postinstalled Expansion Anchor: Minimum **3/8-inch-** diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.
- B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
- C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than **2-inch** height adjustment. Terminate bottom of frames at top of underlayment.
- D. Material: ASTM A879/A879M, Commercial Steel (CS), **04Z** coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

2.8 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.
- E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for

application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

2.9 FABRICATION

- A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
 - 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
- B. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule on Drawings, and templates.
 - 1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 - 2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.
- C. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with mitered hairline joints.
 - 1. Provide stops and moldings flush with face of door, and with beveled, square stops unless otherwise indicated.
 - 2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
 - 3. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
 - 4. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than **9 inches** o.c. and not more than **2 inches** o.c. from each corner.

2.10 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

- A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.
- B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.
 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
 2. Floor Anchors: Secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 3. Solidly pack mineral-fiber insulation inside frames.
 4. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
 - a. Squareness: Plus or minus **1/16 inch**, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus **1/16 inch**, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus **1/16 inch**, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus **1/16 inch**, measured at jambs at floor.

- C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.
 - 1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.
- D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

3.3 REPAIR

- A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

END OF SECTION 081113

SECTION 083613 - SECTIONAL DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sectional-door assemblies.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.
2. Section 099113 "Exterior Painting" for finish painting of factory-primed steel doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of sectional door and accessory.

1. Include construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.
2. For power-operated doors, include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

B. Shop Drawings: For each installation and for components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. Include diagrams for power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For manufacturer's warranty .

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sectional doors to include in maintenance manuals.
- B. Manufacturer's warranty.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Failure of components or operators before reaching required number of operation cycles.
 - c. Faulty operation of hardware.
 - d. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
 - e. Delamination of exterior or interior facing materials.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SECTIONAL-DOOR ASSEMBLY <Insert drawing designation>

- A. Sectional Door (TYPICAL OVERHEAD DOOR) (TYPICAL OVERHEAD DOOR): Providesteel sectional door formed with hinged sections and fabricated so that finished door assembly is rigid and aligned with tight hairline joints; free of warp, twist, and deformation; and complies with requirements in DASMA 102.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Overhead Door Corporation
 - b. Wayne Dalton; a division of Overhead Door Corporation

- B. Operation Cycles: Door components and operators capable of operating for not less than 25,000 operation cycles. One operation cycle is complete when door is opened from closed position to the open position and returned to closed position.
- C. U-Value: As indicated in Drawings.
- D. Steel Door Sections: ASTM A653/A653M, zinc-coated (galvanized), cold-rolled, commercial steel sheet with G60 zinc coating.
 - 1. Door-Section Thickness: Manufacture's Standard thickness for required U-value.
 - 2. Section Faces:
 - a. Thermal-Break Construction: Provide sections with continuous thermal-break construction separating the exterior and interior faces of door.
 - b. Exterior Face: Fabricated from single sheets, not more than 24 inches high; with horizontal meeting edges rolled to continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove, weather- and pinch-resistant seals and reinforcing flange return.
 - 1) Steel Sheet Thickness: 20 gauge minimum nominal coated thickness.
 - 2) Surface: Manufacturer's standard, As selected by Owner.
 - c. Interior Face: Enclose insulation completely within steel exterior facing and interior facing material, with no exposed insulation. Provide the following interior-facing material:
 - 1) Zinc-Coated (Galvanized) Steel Sheet: With minimum nominal coated thickness of dimension recommended in writing by manufacturer to comply with performance requirements.
 - 3. End Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet not less than Manufacturer's standard nominal coated thickness and welded to door section.
 - 4. Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard insulation of type indicated below:
 - a. Board Insulation: Polystyrene, or, polyurethane, secured to exterior face sheet.
- E. Track: Manufacturer's standard, galvanized-steel, high-lift track system. Provide complete system including brackets, bracing, and reinforcement to ensure rigid support of ball-bearing roller guides.
 - 1. Material: Galvanized steel, ASTM A653/A653M, minimum **G60** zinc coating.
 - 2. Size: As recommended in writing by manufacturer for door size, weight,

- track configuration and door clearances indicated on Drawings.
3. Track Reinforcement and Supports: Provide galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced **2 inches** apart for door-drop safety device.
 - a. Vertical Track: Incline vertical track to ensure weathertight closure at jambs. Provide intermittent jamb brackets attached to track and wall.
 - b. Horizontal Track: Provide continuous reinforcing angle from curve in track to end of track, attached to track and supported at points by laterally braced attachments to overhead structural members.
 - F. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom top, and, jambs of door.
 - G. Windows: Manufacturer's standard window units of shape and size and in locations indicated on Drawings. Set glazing in vinyl, rubber, or neoprene glazing channel. Provide removable stops of same material as door-section frames. Provide the following glazing:
 1. Insulating Glass Units: Manufacturer's standard.
 - H. Hardware: Heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless steel, or other corrosion-resistant fasteners, to suit door type.
 1. Hinges: Heavy-duty, galvanized-steel hinges of not less than **0.079-inch** nominal coated thickness at each end stile and at each intermediate stile, in accordance with manufacturer's written recommendations for door size.
 - a. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is impossible.
 - b. Provide double-end hinges where required for doors more than **16 ft.** wide unless otherwise recommended by door manufacturer in writing.
 2. Rollers: Heavy-duty rollers with steel ball bearings in case-hardened steel races, mounted to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Match roller-tire diameter to track width.
 - a. Roller-Tire Material: Manufacturer's standard.
 3. Push/Pull Handles: Equip each door with galvanized-steel lifting handles on each side of door, finished to match door.
 - I. Locking Device:
 1. Slide Bolt: Fabricate with side-locking bolts to engage through slots in

tracks for locking by padlock, located on single-jamb side, operable from inside only.

2. Chain Lock Keeper: Suitable for padlock.

J. Counterbalance Mechanism:

1. Torsion Spring: Adjustable-tension torsion springs complying with requirements of DASMA 102 for number of operation cycles indicated, mounted on torsion shaft.
2. Cable Drums and Shaft for Doors: Cast-aluminum cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised.
 - a. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft.
 - b. Provide one additional midpoint bracket for shafts up to **16 ft.** long and two additional brackets at one-third points to support shafts more than **16 ft.** long unless closer spacing is recommended in writing by door manufacturer.
3. Cables: Galvanized-steel, multistrand, lifting cables with cable safety factor of at least 5 to 1.
4. Cable Safety Device: Include a spring-loaded steel or bronze cam mounted to bottom door roller assembly on each side and designed to automatically stop door if lifting cable breaks.
5. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.
6. Bumper: Provide spring bumper at each horizontal track to cushion door at end of opening operation.

K. Manual Door Operator:

1. This subsection specifies the operator type for all sectional doors except one door labeled as Door #2 per the Drawings.
2. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 25 lbf force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

L. Electric Door Operator: Electric door operator assembly of size and capacity recommended by door manufacturer for door and operation cycles specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. This subsection specifies the operator type for one sectional door labeled as Door #2 per the Drawings.
2. Comply with NFPA 70.
3. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24 V ac or dc.

4. Safety: Listed in accordance with UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 ft. or lower.
5. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day.
6. Operator Type: Manufacturer's standard for door requirements.
7. Motor: Reversible-type for interior, clean, and dry motor exposure. Use adjustable motor-mounting bases for belt-driven operators.
 - a. Motor Size: As required to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. and not more than 12 in./sec., without exceeding nameplate ratings or service factor.
 - b. Electrical Characteristics:
 - 1) Phase: Coordinate with Electrical Designer .
 - 2) Voltage: Coordinate with Electrical Designer.
8. Limit Switches: Equip motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
9. Obstruction Detection: Automatic external entrapment protection consisting of automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.
 - a. Monitored Entrapment Protection: Photoelectric sensor designed to interface with door-operator control circuit to detect damage to or disconnection of sensor and complying with requirements in UL 325.
10. Control Station: Surface mounted, three-position (open, close, and stop) control.
 - a. Operation: Push button.
 - b. Interior-Mounted Unit: Full-guarded, surface-mounted, standard-duty, weatherproof-type, NEMA ICS 6, Type 4 enclosure.
 - c. Features: Provide the following:
 - 1) Vehicle detection operation.
 - 2) Radio-control operation.
11. Emergency Manual Operation: Chain-hoist operator consisting of endless steel hand chain, chain-pocketed wheel and guard, and gear reduction unit with a maximum 25 lbf,force for door operation. Provide allow-steel hand chain with chain holder secured to operator guide.
12. Emergency Operation Disconnect Device: Hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from

- operating when emergency operator is engaged.
13. Motor Removal: Design operator so motor can be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
- M. Metal Finish: Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" for recommendations for applying and designating finishes.
1. Factory Prime Steel Finish: Compatible with field-applied finish and in manufacturer's standard color. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

2.2 SOURCE LIMITATIONS

- A. Obtain sectional doors from single source from single manufacturer.
1. Obtain operators and controls from sectional door manufacturer.

2.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Provide sectional doors that comply with performance requirements specified without failure from defective manufacture, fabrication, installation, or other defects in construction.
- B. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.
1. Design Wind Load: As indicated on Drawings.
 2. Deflection Limits: Design sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.
 - a. Deflection of door sections in horizontal position (open) shall not exceed 1/120 of door width.
 - b. Deflection of horizontal track assembly shall not exceed 1/240 of door height.
- C. Seismic Performance: Provide sectional doors that withstand the effects of earthquake motions determined in accordance with ASCE/SEI 7.
1. Component Importance Factor: 1.0.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

- A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; in accordance with manufacturer's written instructions.
- B. Tracks:
 - 1. Fasten vertical track assembly to opening jambs and framing with fasteners spaced not more than **24 inches** apart.
 - 2. Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by welding or bolting, or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.
- C. Power-Operated Doors: Install automatic garage doors openers in accordance with UL 325.

3.3 STARTUP SERVICES

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks in accordance with manufacturer's written instructions.
 - 2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.

- C. Adjust doors and seals to provide weather-resistant fit around entire perimeter.
- D. Touchup Painting Galvanized Material: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A780/A780M.

3.5 DEMONSTRATION

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

END OF SECTION 083613

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hinges.
2. Bored locks.
3. Mortise locks.
4. Surface closers.
5. Wall- and floor-mounted stops.
6. Door gasketing.
7. Thresholds.

1.2 COORDINATION

- A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Security: Coordinate installation of door hardware, keying, and access control with Owner.

1.3 ACTION SUBMITTALS

A. Product Data:

1. All Door Hardware product types.

1.4 CLOSEOUT SUBMITTALS

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

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lockup for door hardware delivered to Project site.

- B. Tag each item or package separately with identification coordinated with the final

door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1.6 WARRANTY

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

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of door hardware from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Means of Egress Doors: Latches do not require more than **15 lbf** to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC A117.1.
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than **5 lbf**.
 - 2. Comply with the following maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: **5 lbf** applied perpendicular to door.
 - b. Sliding or Folding Doors: **5 lbf** applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - 3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than **1/2 inch** high.

4. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a position of 12 degrees from the latch.
5. Adjust spring hinges so that, from an open position of 70 degrees, the door will take at least 1.5 seconds to move to the closed position.

2.3 HINGES

- A. Hinges: ANSI/BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. McKinney Products Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY

2.4 MECHANICAL LOCKS AND LATCHES

- A. Lock Functions: As indicated in door hardware schedule.
- B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
 1. Bored Locks: Minimum **1/2-inch** latchbolt throw.
 2. Mortise Locks: Minimum **3/4-inch** latchbolt throw.
 3. Deadbolts: Minimum 1.25-inch bolt throw.
- C. Lock Backset: **Match other similar doors at adjacent existing building**, unless otherwise indicated.
- D. Lock Trim:
 1. Description: As indicated on Drawings.
- E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
- F. Bored Locks: ANSI/BHMA A156.2, Grade 1, Series 4000.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:

- a. Schlage®, an Allegion company
- G. Mortise Locks: ANSI/BHMA A156.13, ; stamped steel case with steel or brass parts; Series 1000.
 - 1. Manufacturers: Subject to compliance with requirements, :
 - a. Lawrence Hardware Inc.
 - b. Schlage®, an Allegion company

2.5 KEYING

- A. Keying System: Factory registered, complying with guidelines in ANSI/BHMA A156.28, appendix. Provide one extra key blank for each lock.
 - 1. Existing System:
 - a. Master key or grand master key locks to Owner's existing system.
- B. Keys: .
 - 1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
 - a. Notation: "DO NOT DUPLICATE."

2.6 SURFACE CLOSERS

- A. Surface Closers: ANSI/BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Allegion plc

2.7 MECHANICAL STOPS AND HOLDERS

- A. Wall- and Floor-Mounted Stops: ANSI/BHMA A156.16.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:

- a. Allegion plc

2.8 DOOR GASKETING

- A. Door Gasketing: ANSI/BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Pemko Manufacturing Company Inc.; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY
- B. Maximum Air Leakage: When tested in accordance with ASTM E283/E283M with tested pressure differential of **0.3 inch wg**, as follows:
 - 1. Gasketing on Single Doors: **0.3 cfm/sq. ft.** of door opening.

2.9 THRESHOLDS

- A. Thresholds: ANSI/BHMA A156.21; fabricated to full width of opening indicated.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Pemko Manufacturing Company Inc.; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY

2.10 FABRICATION

- A. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and ANSI/BHMA A156.18.
- B. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended; however, aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.
 - 1. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.11 FINISHES

- A. Provide finishes complying with ANSI/BHMA A156.18 as indicated in door hardware schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames in accordance with ANSI/SDI A250.6.
- B. Wood Doors: Comply with door and hardware manufacturers' written instructions.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage

fasteners. Space fasteners and anchors in accordance with industry standards.

- C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every **30 inches** of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 - 1. Replace construction cores with permanent cores as directed by Owner.
 - 2. Furnish permanent cores to Owner for installation.
- E. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of an approved sealant..
- F. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.
- G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
 - 1. Do not notch perimeter gasketing to install other surface-applied hardware.
- H. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

3.5 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.

- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.6 DOOR HARDWARE SCHEDULE

- A. As indicated in Drawings.

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Insulating glass.
 - 2. Glazing tapes.
 - 3. Miscellaneous glazing materials.

1.2 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; **12 inches** square.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For glass.
- C. Product Test Reports: For fabricated glass, and, glazing sealants, for tests performed by a qualified testing agency.
 - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

1.6 QUALITY ASSURANCE

- A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved and certified by primary glass manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below **40 deg F**.

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects

include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

- D. Manufacturer's Special Warranty for Heat-Soaked Tempered Glass: Manufacturer agrees to replace heat-soaked tempered glass units that spontaneously break due to nickel sulfide (NiS) inclusions at a rate exceeding 0.3 percent (3/1000) within specified warranty period. Coverage for any other cause is excluded.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Source Limitations for Glass: Obtain glass from single source from single manufacturer.
- B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or

glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:
 - 1. Design Wind Pressures: As indicated on Drawings.
 - a. Wind Design Data: As indicated on Drawings.
 - b. Basic Wind Speed: 98 mph.
 - c. Importance Factor: 1.0.
 - d. Exposure Category: C.
 - 2. Thermal Loads: Design glazing to resist thermal stress breakage induced by differential temperature conditions and limited air circulation within individual glass lites and insulated glazing units.
- C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. NGA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Thickness: Where glass thickness is indicated, it is a minimum.
 - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.

2.4 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
 - 1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.5 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

- C. Setting Blocks:
 - 1. EPDM with Shore A durometer hardness of 85, plus or minus 5.
 - 2. Type recommended in writing by sealant or glass manufacturer.

- D. Spacers:
 - 1. Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
 - 2. Type recommended in writing by sealant or glass manufacturer.

- E. Edge Blocks:
 - 1. EPDM with Shore A durometer hardness per manufacturer's written instructions.
 - 2. Type recommended in writing by sealant or glass manufacturer.

- F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.6 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
 - 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep systems.
 - 3. Minimum required face and edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than **50 inches**.
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide **1/8-inch-** minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away;

seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.6 CLEANING AND PROTECTION

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 088000

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Interior gypsum board.
 2. Texture finishes.

1.2 ACTION SUBMITTALS

- A. Product Data: For the following:
1. Gypsum wallboard.
 2. Gypsum ceiling board.
 3. Mold-resistant gypsum board.
 4. Aluminum trim.
- B. Samples: For the following products:

1.3 DELIVERY, STORAGE AND HANDLING

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

1.4 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of gypsum panel and joint finishing material from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 GYPSUM BOARD, GENERAL

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

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Wallboard: ASTM C1396/C1396M.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed; SAINT-GOBAIN
 - b. USG Corporation
 - 2. Thickness: **1/2 inch**.
 - 3. Long Edges: Tapered.
- B. Gypsum Ceiling Board: ASTM C1396/C1396M.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed; SAINT-GOBAIN
 - b. USG Corporation
 - 2. Thickness: **1/2 inch**.
 - 3. Long Edges: Tapered.
- C. Mold-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. CertainTeed; SAINT-GOBAIN
 - b. USG Corporation
2. Core: 1/2 inch, regular type.
 3. Long Edges: Tapered.
 4. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.
 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
 2. Shapes:
 - a. Cornerbead.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
 1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
- D. Joint Compound for Tile Backing Panels:
 1. Water-Resistant Gypsum Backing Board: Use setting-type taping compound and setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

- A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

- C. Vapor Retarder: As specified in Section 072600 "Vapor Retarders."

2.7 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.
- B. Non-Aggregate Finish: Premixed, vinyl texture finish for spray application.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed; SAINT-GOBAIN
 - b. ProForm Finishing Products, LLC provided by National Gypsum Company
 - c. USG Corporation
 - 2. Texture: Orange peel.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

- A. Comply with ASTM C840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than **1/16 inch** of open space between panels. Do not force into place.

- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than **8 sq. ft.** in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow **1/4- to 3/8-inch-** wide joints to install sealant.
- G. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. Wallboard Type: Vertical surfaces unless otherwise indicated.
 - 2. Ceiling Type: Ceiling surfaces.
 - 3. Mold-Resistant Type: Walls and partitions within 2 feet (610 mm) of service sinks, urinals and water closets..
- B. Single-Layer Application:
 - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLATION OF TILE BACKING PANELS

- A. Water-Resistant Backing Board: Install where indicated with **1/4-inch** gap where panels abut other construction or penetrations.
- B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLATION OF TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
 1. Cornerbead: Use at outside corners.

3.6 FINISHING OF GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 1. Level 2: Panels that are substrate for tile.
 2. Level 5: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.7 APPLICATION OF TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture free of starved spots or other evidence of thin application or of application patterns.
- C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written instructions.

3.8 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ceramic mosaic tile.
 - 2. Setting material.
 - 3. Grout materials.

1.2 DEFINITIONS

- A. General: Definitions in ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. Face Size: Actual tile size, excluding spacer lugs.
- C. Module Size: Actual tile size plus joint width indicated.

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Ceramic mosaic tile.
 - 2. Setting material.
 - 3. Grout materials.
- B. Samples for Initial Selection: For tile, grout, and accessories involving color selection or shade variation.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of product, including product use classification.
- C. Product Test Reports:
 - 1. Tile-setting and -grouting products.
 - 2. Certified porcelain tile.
 - 3. Slip-resistance test reports from qualified independent testing agency.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer employs only Ceramic Tile Education Foundation Certified Installers, or, installers recognized by the U.S. Department of Labor as Journeyman Tile Layers for Project.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in "Referenced Standards" Article in the Evaluations and manufacturer's written instructions.

1.8 WARRANTY

- A. System Warranty: Manufacturer's non-prorated comprehensive warranty that agrees to repair and replace defective installation areas, material, and labor that fail under normal usage within specified warranty period.
 1. Warranty Period: Five years from date of Product Purchase.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 1. Provide tile complying with Standard Grade requirements.

- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
 - 1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.
- E. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.2 CERAMIC MOSAIC TILE

- A. Ceramic Mosaic Tile Type: .
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. American Olean; a brand of Dal-Tile Corporation
 - b. Crossville, Inc.
 - c. Daltile; a brand of Dal-Tile Corporation
 - d. Jeffrey Court Inc.
 - e. Marazzi USA; a brand of Dal-Tile Corporation
 - f. Portobello America, Inc.
 - 2. Certification: Porcelain tile certified by the Porcelain Tile Certification Agency.
 - 3. Module Size: As selected by Owner.
 - 4. Thickness: **1/4 inch**.
 - 5. Face: Plain with cushion edges.
 - 6. Surface: As selected by Owner.
 - 7. Product Use Classification: Interior, Wet (IW).
 - 8. Tile Color and Pattern: As selected by Owner.
 - 9. Grout Color: .
 - 10. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable and matching characteristics of adjoining flat tile. Provide

shapes as follows, selected from manufacturer's standard shapes:

- a. Base Cove: Cove, module size As selected by Owner.
- b. Wainscot Cap for Thinset Mortar Installations: Surface bullnose, module size As selected by Owner.
- c. External Corners for Thinset Mortar Installations: Surface bullnose, module size As selected by Owner.
- d. Internal Corners:
 - 1) Field-buttet square corners. For coved base and cap, use angle pieces designed to fit with stretcher shapes.

2.3 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to **1/16 inch** above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to **1/2 inch** or less above adjacent floor surface.

2.4 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting and adhesive materials for installations indicated.
- B. Vapor-Retarder Membrane: Polyethylene sheeting, ASTM D4397, **4.0 mils** thick.
- C. Metal Flooring Transitions: Profile designed specifically for flooring applications; height to match tile and setting-bed thickness.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Blanke Corporation
 - b. Custom Building Products
 - c. Dural USA, Inc.
 - d. Profillitec Corp.
 - e. Progress Profiles America Inc.
 - f. Schluter Systems L.P.
 2. Description: As selected by Owner.
 3. Material and Finish: Metallic or combination of metal and PVC or neoprene base; As selected by Owner exposed-edge material.

- D. Temporary Protective Coating: Formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products and easily removable after grouting is completed without damaging grout or tile.
- E. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- F. Grout Sealer: Grout manufacturer's standard product for sealing grout joints that does not change color or appearance of grout.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Remove coatings, including curing compounds or other coatings, that are incompatible with tile-setting materials.
- B. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- C. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1 and is sloped **1/4 inch per foot** toward drains.
- D. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- E. Substrate Flatness:
 - 1. For tile shorter than **15 inches**, confirm that structure or substrate is limited to variation of **1/4 inch in 10 ft.** from the required plane, and no more than **1/16 inch in 12 inches** when measured from tile surface high points.
 - 2. For large format tile, tile with at least one edge **15 inches** or longer, confirm that structure or substrate is limited to **1/8 inch in 10 ft.** from the required plane, and no more than **1/16 inch in 24 inches** when measured from tile surface high points.
- F. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION OF CERAMIC TILE SYSTEM

- A. Install tile backing panels and treat joints in accordance with ANSI A108.11 and manufacturer's written instructions for type of application indicated.
- B. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
 - 1. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.
- C. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness

that is bonded securely to substrate.

1. Allow crack isolation membrane to cure before installing tile or setting materials over it.
- D. Mix mortars and grouts to comply with "Referenced Standards" Article in the Evaluations and mortar and grout manufacturers' written instructions.
1. Add materials, water, and additives in accurate proportions.
 2. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.
- E. Install tile in accordance with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of ANSI A108 series that are referenced in TCNA installation methods and specified in tile installation schedules, and apply to types of setting and grouting materials used.
1. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
 2. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
 3. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
 4. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
 5. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - a. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets, so joints between sheets are not apparent in finished Work.
 - b. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - c. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
 6. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

- F. Thresholds: Install stone and solid surface thresholds in same type of setting bed as adjacent floor unless otherwise indicated.
 - 1. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in modified dry-set, improved modified dry-set mortar (thinset), as recommended by tile manufacturer.
- G. Metal Flooring Transitions: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.
- H. Metal Wall Trim: Install at locations, as determined by field conditions or selected by Owner.
- I. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors in accordance with manufacturer's written instructions. As soon as sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile in accordance with tile and grout manufacturer's written instructions. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.5 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coverings and rinse neutral protective

cleaner from tile surfaces.

3.6 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor:

1. TCNA F111 Locker Room Floor: Method ANSI A108.1C. Cement mortar bed (thickset) installed over cleavage membrane.
 - a. Ceramic Tile Type: As selected by Owner.
 - b. Grout: High-performance sanded cement, High-performance unsanded cement grout, as selected by Owner.
 - c. Joint Width: 1/8 inch.
 - d. Movement Joints: As needed and to be determined in field by Installer.

B. Interior Wall Installations, Wood or Metal Studs or Furring:

1. TCNA W245 Restroom Wainscot: Thinset mortar on glass-mat, water-resistant gypsum backer board.
 - a. Ceramic Tile Type: As selected by Owner.
 - b. Thinset Mortar: Dry-set, Modified dry-set, Improved modified dry-set mortar, as recommended by manufacturer.
 - c. Grout: High-performance sanded cement, High-performance unsanded cement grout, as selected by Owner.
 - d. Joint Width: 1/8 inch.

END OF SECTION 093013

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Finish coatings for hollow metal doors and frames, sectional doors, and other exterior unpainted surfaces.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include preparation requirements and application instructions.
2. Indicate VOC content.

B. Samples: For each type of topcoat product.

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

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than **45 deg F**.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.4 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between **50 and 95 deg F**.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than **5 deg F** above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 FINISH COATINGS

- A. Exterior Latex Paint, Semigloss: Water-based, pigmented emulsion coating formulated for alkali, mold, microbial, and water resistance and for use on exterior surfaces, such as masonry, portland cement plaster, and primed wood and metal.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Benjamin Moore & Co.
 - b. Rodda Paint Co.
 - c. Sherwin-Williams Company (The)
 - 2. Gloss Level: Manufacturer's standard semigloss finish, or satin, as approved by Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.
- D. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 INSTALLATION

- A. Apply paints in accordance with manufacturer's written instructions.
 1. Use applicators and techniques suited for paint and substrate indicated.
 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 1. Paint the following work where exposed to view:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.

- d. Pipe hangers and supports.
- e. Metal conduit.
- f. Plastic conduit.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 - 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 - 3. Allow empty paint cans to dry before disposal.
 - 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

- A. Shop-Primed Metal Substrates:
 - 1. Prime Coat: Factory applied.
 - 2. Intermediate Coat: Matching topcoat.
 - 3. Topcoat: Exterior latex paint, semigloss or satin. Verify sheen with Owner.

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Water-based finish coatings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include preparation requirements and application instructions.
 - 2. Indicate VOC content.
- B. Samples: For each type of topcoat product.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than **45 deg F**.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.4 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between **50 and 95 deg F**.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than **5 deg F** above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 WATER-BASED FINISH COATS

- A. Interior, Latex, Eggshell: Pigmented, water-based paint for use on primed/sealed

interior plaster and gypsum board, and on primed wood and metals.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Benjamin Moore & Co.
 - b. Rodda Paint Co.
 - c. Sherwin-Williams Company (The)
2. Gloss and Sheen Level: Manufacturer's standard eggshell finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Concrete: 12 percent.
 2. Fiber-Cement Board: 12 percent.
 3. Masonry (Clay and CMUs): 12 percent.
 4. Wood: 15 percent.
 5. Gypsum Board: 12 percent.
 6. Plaster: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Plaster Substrates: Verify that plaster is fully cured.
- E. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.
- F. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- G. Proceed with coating application only after unsatisfactory conditions have been corrected.
 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

3.3 INSTALLATION

- A. Apply paints according to manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- C. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- D. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in occupied spaces:
 - a. Uninsulated metal piping.

- b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Metal conduit.
 - e. Plastic conduit.
 - f. Other items as directed by Engineer.
2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 3. Allow empty paint cans to dry before disposal.
 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 INTERIOR PAINTING SCHEDULE

- A. Steel Substrates:
 1. Latex System, Alkyd Primer Typical Steel Doors:
 - a. Prime Coat: Shop primer specified in Section where substrate is specified.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, satin.
- B. Gypsum Board Substrates:
 1. Latex over Latex Sealer System Typical Interior Walls & Ceilings:

- a. Prime Coat: Interior latex primer sealer.
- b. Intermediate Coat: Matching topcoat.
- c. Topcoat: Interior, latex, eggshell.

END OF SECTION 099123

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Public-use washroom accessories.
 2. Underlavatory guards.

1.2 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.3 ACTION SUBMITTALS

- A. Product Data:
1. All Product types as indicated in Drawings.
 2. Underlavatory guards.
- B. Product Data Submittals: For each product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 3. Include electrical characteristics.
- C. Samples: For each exposed product and for each finish specified, full size.
- D. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
1. Identify locations using room designations indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For manufacturer's special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For accessories to include in maintenance manuals.

1.6 WARRANTY

- A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, visible silver spoilage defects.
 - 2. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Toilet-Compartment Occupancy-Indicator Systems: Manufacturer agrees to repair or replace toilet-compartment occupancy-indicator systems that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Manufacturer's Special Warranty for Hand Dryers: Manufacturer agrees to repair or replace hand dryers that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Structural Performance: Design accessories and fasteners to comply with the following requirements:
 - 1. Grab Bars: Installed units are able to resist **250 lbf** concentrated load applied in any direction and at any point.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

- A. Source Limitations: Obtain each type of public-use washroom accessory from single source from single manufacturer.
- B. Toilet Tissue (Roll) Dispenser:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ASI-American Specialties, Inc.
 - b. Bobrick Washroom Equipment, Inc
 - c. Bradley Corporation
 - 2. Description: Roll-in-reserve dispenser with hinged front secured with tumbler lockset.
 - 3. Mounting: Surface mounted.
 - 4. Operation: Noncontrol delivery with standard spindle.
 - 5. Capacity: Designed for 5-inch- diameter tissue rolls.
 - 6. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
- C. Paper Towel (Roll) Dispenser:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ASI-American Specialties, Inc.
 - b. Bobrick Washroom Equipment, Inc
 - c. Bradley Corporation
 - 2. Description: Pull-towel-actuated mechanism that permits controlled delivery of paper rolls in preset lengths.
 - 3. Mounting: Surface mounted.
 - 4. Minimum Capacity: 8-inch- wide, 800-foot- long roll.
 - 5. Material and Finish: ABS plastic, gray, with translucent front cover.
 - 6. Lockset: Tumbler type.
- D. Waste Receptacle:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ASI-American Specialties, Inc.
 - b. Bobrick Washroom Equipment, Inc

c. Bradley Corporation

2. Mounting: Freestanding, Undercounter.
3. Minimum Capacity: 23 Gallon.
4. Material and Finish: Plastic.
5. Liner: Disposable liner.
6. Lockset: Tumbler type for waste receptacle.

E. Soap Dispenser:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ASI-American Specialties, Inc.
 - b. Bobrick Washroom Equipment, Inc
 - c. Bradley Corporation
2. Description: Designed for manual operation and dispensing soap in liquid or lotion form.
3. Mounting: Vertically oriented, surface mounted.
4. Capacity: 40oz.
5. Materials: ABS Plastic.
6. Lockset: Tumbler type.
7. Refill Indicator: Window type.

F. Grab Bar:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ASI-American Specialties, Inc.
 - b. Bobrick Washroom Equipment, Inc
 - c. Bradley Corporation
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, **0.05 inch** thick.
 - a. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin).
4. OD: 1-1/4 inches.
5. Configuration and Length: As indicated on Drawings.

G. Mirror Unit:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work

include, but are not limited to, the following:

- a. ASI-American Specialties, Inc.
 - b. Bobrick Washroom Equipment, Inc
 - c. Bradley Corporation
2. Frame: Stainless steel angle, 0.05 inch thick, Stainless steel channel.
 - a. Corners: Manufacturer's standard.
 3. Size: 24 inches wide x 36 inches tall minimum.
 4. Hangers: Manufacturer's standard rigid, tamper and theft resistant.

2.3 UNDERLAVATORY GUARDS

A. Underlavatory Guard:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Buckaroos, Inc.
 - b. Plumberex Specialty Products, Inc.
 - c. Truebro; IPS Corporation
2. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
3. Material and Finish: Antimicrobial, molded plastic, white.

2.4 MATERIALS

- A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, **0.031-inch-**minimum nominal thickness unless otherwise indicated.
- B. Brass: ASTM B19, flat products; ASTM B16/B16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B30, castings.
- C. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), **0.036-inch-** minimum nominal thickness.
- D. Galvanized-Steel Sheet: ASTM A653/A653M, with **G60** hot-dip zinc coating.
- E. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.

- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.
- G. Chrome Plating: ASTM B456, Service Condition Number SC 2 (moderate service).
- H. Mirrors: ASTM C1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.5 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of 4 keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories in accordance with manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
 - 1. Remove temporary labels and protective coatings.
- B. Grab Bars: Install to comply with specified structural-performance requirements.
- C. Shower Seats: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Clean and polish exposed surfaces in accordance with manufacturer's written instructions.

END OF SECTION 102800

SECTION 113013 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Refrigeration appliances. (Provided by Owner)
 - 2. Cleaning appliances.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Cooking appliances.
 - 2. Refrigeration appliances.
 - 3. Cleaning appliances.
- B. Product Data Submittals: For each product.
 - 1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of appliance.
- B. Sample Warranties: For manufacturers' special warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of residential appliance from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Gas-Fueled Appliances: Certified by a qualified testing agency for each type of gas-fueled appliance according to ANSI Z21 Series standards.
- C. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with applicable provisions in ICC A117.1.

2.3 REFRIGERATION APPLIANCES

- A. Refrigerator/Freezer: Provided by Owner .
 - 1. Type: Freestanding.
 - 2. Dimensions:
 - a. Width: 30 inches.
 - b. Depth: 33-1/4 inches.
 - c. Height: 70 inches.

2.4 CLEANING APPLIANCES

- A. Dishwasher: Complying with AHAM DW-1.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bosch US; BSH Home Appliances Corporation
 - b. Frigidaire
 - c. GE Appliances; Haier Group
 - d. KitchenAid; Whirlpool Corporation
 - e. LG Electronics USA, Inc.; LG Electronics Inc.
 - f. Samsung Electronics America, Inc. (SEA); Samsung Electronics Co., Ltd. (SEC)
 - g. Whirlpool Corporation
 - 2. Type: Built-in undercounter.
 - 3. Dimensions:
 - a. Width: 24 inches.
 - b. Depth: 23 inches, 25-3/4 inches.
 - c. Height: As required for undercounter installation.
 - 4. Sound Level: Maximum 48 dB.

5. Tub and Door Liner: Stainless steel with sealed detergent and automatic rinsing-aid dispensers.
6. Rack System: Nylon, PVC-coated sliding dish racks, with removable cutlery basket.
7. Controls: Touch-pad controls with wash cycles and hot-air and heat-off drying cycle options.
8. Features:
 - a. Waste food disposer.
 - b. Self-cleaning food-filter system.
 - c. Hot-water booster heater for 140 deg F wash water with incoming water at **100 deg F**.
 - d. Lock-out feature.
 - e. Delay-wash option.
 - f. Digital display panel.
9. Front Panel: Manufacturer's standard, Porcelain enamel, Stainless steel.
 - a. Panel Color: White.
10. Appliance Color/Finish: White, Stainless steel.

2.5 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.
- C. Examine walls, ceilings, and roofs for suitable conditions where overhead exhaust hoods will be installed.

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

3.2 INSTALLATION

- A. Install appliances according to manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment. Anchor equipment as required by manufacturer.

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
 - 2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After installation, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.

END OF SECTION 113013

SECTION 123216 - MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic-laminate-clad casework.
 - 2. Hardware and accessories.

1.2 DEFINITIONS

- A. Definitions in the AWI/AWMAC/WI's "Architectural Woodwork Standards" apply to the Work of this Section.

1.3 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that casework can be supported and installed as indicated.

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Plastic-laminate-clad casework.
 - 2. Hardware and accessories.
- B. Shop Drawings: For plastic-laminate-clad casework.
 - 1. Include plans, elevations, sections, and attachments to other work including blocking and reinforcements required for installation.
 - 2. Indicate types and sizes of casework.
 - 3. Indicate manufacturer's catalog numbers for casework.
 - 4. Show fabrication details, including types and locations of hardware.
 - 5. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and equipment.
- C. Samples: For casework and hardware finishes.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Sample Warranty: For special warranty.
- C. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during remainder of construction period.
- B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
- C. Field Measurements: Where casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.
- D. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before enclosing them, and indicate measurements on Shop Drawings.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of casework that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Delamination of components or other failures of glue bond.
 - b. Warping of components.
 - c. Failure of operating hardware.
2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR CASEWORK

- A. Quality Standard: Unless otherwise indicated, comply with the AWI/AWMAC/WI's "Architectural Woodwork Standards" for grades of casework indicated for construction, finishes, installation, and other requirements.
 1. Grade: Premium.

2.2 PLASTIC-LAMINATE-CLAD CASEWORK

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. Advanced Cabinet Systems (ACS)
 2. Case Systems Inc
 3. CIF Lab Solutions LP
 4. Hausmann Industries
 5. ICScientific
 6. Mica-Tec
 7. R. C. Smith Company
 8. Sidney Millwork Company
 9. Stevens Industries, Inc.
 10. TMI Systems Corporation
 11. Windham Millwork, Inc
- B. Source Limitations: Obtain from single source from single manufacturer.
- C. Design: Face-frame cabinet construction with the following door and drawer-front style:
 1. Reveal overlay with recessed finger pulls machined into faces of doors and drawers.

D. Exposed Materials:

1. Plastic-Laminate Grade: VGS.
 - a. Colors and Patterns: .
2. Edgbanding: Plastic laminate matching adjacent surfaces.
3. Solid Wood: Clear hardwood lumber of species indicated, selected for compatible grain and color.
 - a. Wood Species: White maple.
 - b. Wood Finish: As selected by Owner from manufacturer's full range.

E. Semiexposed Materials:

1. Plastic Laminate: Grade VGS unless otherwise indicated. Provide plastic laminate for semiexposed surfaces unless otherwise indicated.
 - a. Colors and Patterns: As selected by Owner from manufacturer's full range.
 - b. Provide plastic laminate of same grade as exposed surfaces for interior faces of doors and drawer fronts and other locations where opposite side of component is exposed.
2. Hardboard: Use only for cabinet backs where exterior side of back is not exposed.
3. Metal for Steel Drawer Pans: Cold-rolled, carbon-steel sheet complying with ASTM A1008/A1008M; matte finish; suitable for exposed applications.
4. Unless otherwise indicated, provide specified edgbanding on all semiexposed edges.

F. Concealed Materials:

1. Solid Wood: With no defects affecting strength or utility.
2. Plywood: Hardwood plywood.
3. Plastic Laminate: Grade VGS.
4. Particleboard.
5. MDF.
6. Hardboard.

2.3 HARDWARE AND ACCESSORIES

A. Hardware: Unless otherwise indicated, provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware.

1. Use threaded metal or plastic inserts with machine screws for fastening to

particleboard except where hardware is through-bolted from back side.

- B. Frameless Concealed Hinges (European Type): ANSI/BHMA A156.9, Type B01602, self-closing. Provide two hinges for doors less than **48 inches** high, and provide three hinges for doors more than **48 inches** high.
 - 1. Degrees of Opening: 135 degrees.
- C. Wire Pulls: Solid chrome-plated brass wire pulls, fastened from back with two screws.
 - 1. For sliding doors, provide recessed chrome-plated flush pulls.
 - 2. Provide two pulls for drawers more than **24 inches** wide.
- D. Door Catches: Zinc-plated, nylon-roller spring catch, or, dual, self-aligning, permanent magnet catch. Provide two catches on doors more than **48 inches** high.
- E. Door and Drawer Bumpers: Self-adhering, clear silicone rubber.
 - 1. Doors: Provide one bumper at top and bottom of closing edge of each swinging door.
 - 2. Drawers: Provide one bumper on back side of drawer front at each corner.
- F. Drawer Slides: ANSI/BHMA A156.9.
 - 1. Manufacturer's standard.
 - 2. Heavy Duty (Grade 1HD-100): Undermount.
 - a. Type: Full extension.
 - b. Material: Zinc-plated steel slides.
 - c. Motion Feature: Soft close dampener.
 - 3. General-purpose drawers; provide 100 lb load capacity.

2.4 FABRICATION

- A. Plastic-Laminate-Clad Cabinet Construction: As required by referenced quality standard, but not less than the following:
 - 1. Bottoms and Ends of Cabinets, and Tops of Wall Cabinets and Tall Cabinets: **3/4-inch** particleboard.
 - 2. Shelves: 3/4-inch- thick particleboard.
 - 3. Backs of Casework: **1/2-inch-** thick particleboard or MDF where exposed, 1/4-inch- thick hardboard dadoed into sides, bottoms, and tops where not exposed.

4. Drawer Fronts: **3/4-inch** particleboard.
5. Drawer Sides and Backs: **1/2-inch-** thick solid-wood or veneer-core hardwood plywood, with glued dovetail or multiple-dowel joints.
6. Drawer Bottoms: **1/4-inch-** thick hardwood plywood glued and dadoed into front, back, and sides of drawers.
7. Cabinet Doors:
 - a. 48 Inches (1220 mm) High or Less: **3/4 inch** thick, with particleboard or MDF cores and solid-wood stiles and rails.
- B. Filler Strips: Provide as needed to close spaces between casework and walls, ceilings, and equipment. Fabricate from same material and with same finish as casework.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

- A. Grade: Install casework to comply with same quality standard grade as item to be installed.
- B. Install casework level, plumb, and true in line; shim as required using concealed shims. Where casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- C. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within **1/16 inch** of a single plane. Align similar adjoining doors and drawers to a tolerance of **1/16 inch**. Bolt adjacent cabinets together with joints flush, tight, and uniform.
- D. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within **1/16 inch** of a single plane. Fasten cabinets to hanging strips, masonry, framing, wood blocking, or reinforcements in walls and partitions. Align similar adjoining doors to a tolerance of **1/16 inch**.

- E. Fasten casework to adjacent units and to masonry, framing, wood blocking, or reinforcements in walls and partitions to comply with the AWI/AWMAC/WI's "Architectural Woodwork Standards."
- F. Install hardware uniformly and precisely. Set hinges snug and flat in mortises unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.
- G. Adjust operating hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.3 CLEANING

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

END OF SECTION 123216

SECTION 123623.13 - PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic-laminate-clad countertops.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Plastic-laminate-clad countertops.
 - 2. Accessories.
- B. Shop Drawings: For plastic-laminate-clad countertops.
 - 1. Include plans, sections, details, and attachments to other work. Detail fabrication and installation, including field joints.
 - 2. Show locations and sizes of cutouts and holes for items installed in plastic-laminate-clad countertops.
- C. Samples: Plastic laminates in each type, color, pattern, and surface finish required in manufacturer's standard size.
- D. Samples for Initial Selection: For plastic laminates.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For the following:
 - 1. Composite wood products.
 - 2. High-pressure decorative laminate.
 - 3. Chemical-resistant, high-pressure decorative laminate.
 - 4. Adhesives.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom

fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

- B. Installer Qualifications: Installer with not less than 5 years of experience in installation of the specified products.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.
- B. Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
- C. Keep surfaces of countertops covered with protective covering during handling and installation.

1.6 FIELD CONDITIONS

- A. Environmental Limitations without Humidity Control: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Established Dimensions: Where countertops are indicated to fit to other construction, establish dimensions for areas where countertops are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 FABRICATORS

2.2 PLASTIC-LAMINATE-CLAD COUNTERTOPS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of plastic-laminate-clad countertops indicated for construction, finishes, installation, and other requirements.
- B. Grade: Premium.

- C. High-Pressure Decorative Laminate: ISO 4586-3, Grade HGS.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ABET Inc.
 - b. Formica Corporation
 - c. Laminart LLC
 - d. Nevamar Company, LLC
 - e. Pionite; a Panolam Industries International, Inc. brand
 - f. Wilsonart LLC
- D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. As selected by Architect from manufacturer's full range in the following categories:
- E. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- F. Core Material: Particleboard made with exterior glue, As selected by fabricator to comply with quality standard.
- G. Core Material at Sinks: As selected by fabricator to comply with quality standard.
- H. Core Thickness: 3/4 inch.
 - 1. Build up countertop thickness to **1-1/2 inches** at front, back, and ends with additional layers of core material laminated to top.

2.3 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
 - 1. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of countertop and quality grade specified unless otherwise indicated.
 - 1. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
 - 2. Softwood Plywood: DOC PS 1.

2.4 MISCELLANEOUS MATERIALS

- A. Adhesive for Bonding Plastic Laminate: Type I, waterproof type as selected by fabricator to comply with requirements.
 - 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.
- B. Installation Adhesive:
 - 1. As required by Plastic Laminate manufacturer.

2.5 FABRICATION

- A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of **1 inch** over base cabinets. Ease edges to radius indicated for the following:
 - 1. Solid-Wood (Lumber) Members: **1/16 inch** unless otherwise indicated.
- B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Owner seven days in advance of the dates and times countertop fabrication will be complete.
- C. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of cutouts by saturating with varnish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.
- B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing.

3.2 INSTALLATION

- A. Grade: Install countertops to comply with same grade as item to be installed.
- B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
 - 1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately, and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 2. Seal edges of cutouts by saturating with varnish.
- C. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- D. Countertop Installation: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops level and true in line. Use concealed shims as required to maintain not more than a **1/8-inch-in-96-inches** variation from a straight, level plane.
 - 2. Seal joints between countertop and backsplash, if any, and joints where countertop and backsplash abut walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace countertops. Adjust joinery for uniform appearance.
- B. Clean countertops on exposed and semiexposed surfaces.
- C. Protection: Provide Kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of **48 inches** o.c. Remove protection at Substantial Completion.

END OF SECTION 123623.13

SECTION 133419 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural-steel framing.
2. Metal roof panels.
3. Metal wall panels.
4. Thermal insulation.
5. Personnel doors and frames.
6. Windows.
7. Accessories.

B. Related Requirements:

1. Section 083613 "Sectional Doors" for sectional vehicular doors in metal building systems.

1.2 DEFINITIONS

- A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in standards referenced by this Section.

1.3 COORDINATION

- A. Coordinate sizes and locations of concrete foundations and casting of anchor-rod inserts into foundation walls and footings. Anchor rod installation, concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."
- B. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site/Insert location.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of metal building system component.
- B. Shop Drawings: Indicate components by others. Include full building plan, elevations, sections, details and the following:
 - 1. Anchor-Rod Plans: Submit anchor-rod plans and templates before foundation work begins. Include location, diameter, and minimum required projection of anchor rods required to attach metal building to foundation. Indicate column reactions at each location.
 - 2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
 - 3. Metal Roof, and, Wall Panel Layout Drawings: Show layouts of panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, clip spacing, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.
 - 4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches. Insert scale:
 - a. Flashing and trim.
 - b. Gutters.
 - c. Downspouts.
- C. Samples for Initial Selection: For units with factory-applied finishes.
- D. Door Schedule: For doors and frames. Use same designations indicated on Drawings. Include details of reinforcement.
- E. Delegated Design Submittals: For metal building systems.
 - 1. Include analysis data indicating compliance with performance requirements and design data signed and sealed by the qualified professional engineer, certified in the State of Oregon responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For erector, manufacturer, and surveyor.
- B. Welding certificates.
- C. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
 - 1. Name and location of Project.

2. Order number.
 3. Name of manufacturer.
 4. Name of Contractor.
 5. Building dimensions including width, length, height, and roof slope.
 6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
 7. Governing building code and year of edition.
 8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
 9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
 10. Building-Use Category: Indicate category of building use and its effect on load importance factors.
- D. Material Test Reports: For each of the following products:
- E. Source quality-control reports.
- F. Field quality-control reports.
- G. Sample Warranties: For special warranties.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer.
1. Accreditation: Manufacturer's facility accredited according to IAS AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."
 2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.
- B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

2. AWS D1.3, "Structural Welding Code - Sheet Steel."

- D. Structural Steel: Comply with AISC 360, "Specifications for Structural Steel Buildings," for design requirements and allowable stresses.
- E. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with panel installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

1.10 WARRANTY

- A. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 252010Insert number years from date of Substantial Completion.
- B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.
 - 1. Warranty Period: 20Insert number years from date of Substantial Completion.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during

transportation and handling.

- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior. Obtain all components of the metal building system from a single source. The source of the metal building system shall be the metal building manufacturer.
- B. Primary-Frame Type:
 - 1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.
 - 2. Lean-to: Solid- or truss-member, structural-framing system, designed to be partially supported by another structure.
- C. End-Wall Framing:
 - 1. Manufacturer's standard, for buildings not required to be expandable, consisting of primary frame, capable of supporting one-half of a bay design load, and end-wall columns.
- D. Secondary-Frame Type: Manufacturer's standard purlins and joists and exterior-framed (bypass) girts.
- E. Eave Height: Manufacturer's standard height, as indicated by nominal height on Drawings.
- F. Bay Spacing: As indicated on Drawings.
- G. Roof Slope: As indicated in Drawings.
- H. Roof System: Manufacturer's standard metal roof panels.
- I. Exterior Wall System: Manufacturer's standard metal wall panels matching

existing adjacent building.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Seismic Performance: Metal building system to withstand the effects of earthquake motions determined according to ASCE/SEI 7 Insert requirement.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces Insert temperature change.
- D. Structural Performance for Metal Roof and Wall Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
 - 1. Wind Loads: As indicated on Drawings.
- E. Air Infiltration for Metal Roof Panels: Air leakage of not more than **0.06 cfm/sq. ft.** when tested according to ASTM E1680 or ASTM E283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft. 6.24 lbf/sq. ft..
- F. Air Infiltration for Metal Wall Panels: Air leakage of not more than **0.06 cfm/sq. ft.** when tested according to ASTM E283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft. 6.24 lbf/sq. ft..
- G. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E1646 or ASTM E331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 2.86 lbf/sq. ft. 6.24 lbf/sq. ft..
- H. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 2.86 lbf/sq. ft. 6.24 lbf/sq. ft..

- I. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
 - 1. Uplift Rating: UL 30UL 60UL 90.
- J. Solar Reflectance Index: Not less than 7829 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
- K. Energy Performance: Provide roof panels according to one of the following when tested according to CRRC-1:
 - 1. Three-year, aged, solar reflectance of not less than 0.55 and emissivity of not less than 0.75.
 - 2. Three-year, aged, Solar Reflectance Index of not less than 64 when calculated according to ASTM E1980.
- L. Thermal Performance for Opaque Elements: Provide the following maximum U-factors and minimum R-values when tested according to ASTM C1363 or ASTM C518:
 - 1. Roof:
 - a. U-Factor: As indicated in Drawings.
 - b. R-Value: As indicated in Drawings.
 - 2. Walls:
 - a. U-Factor: As indicated in Drawings.
 - b. R-Value: As indicated in Drawings.

2.3 STRUCTURAL-STEEL FRAMING

- A. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."
- B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- C. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.
- D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
 - 1. General: Provide frames with attachment plates, bearing plates, and splice

- members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
 3. Frame Configuration: Single gableOne-directional, slopedLean-to, with high side connected to and supported by another structureMultiple gableLoad-bearing wallMultistory.
 4. Exterior Column: Uniform depthTapered.
 5. Rafter: Uniform depthTapered.
- E. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:
1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
- F. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:
1. Purlins:
 - a. Steel joists of depths indicated on Drawings.
 - 1) Depth: As indicated on DrawingsAs needed to comply with system performance requirementsInsert dimension.
 2. Girts: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum **2-1/2-inch-** wide flanges.
 - a. Depth: As indicated on DrawingsAs required to comply with system performance requirementsInsert dimension.
 3. Base or Sill Angles: Manufacturer's standard base angle, minimum **3-by-2-inch**, fabricated from zinc-coated (galvanized) steel sheet.
 4. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
 5. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
 6. Miscellaneous Structural Members: Manufacturer's standard sections

fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

- G. Bracing: Provide adjustable wind bracing as follows:
1. Rods: ASTM A36/A36M; ASTM A572/A572M, Grade **50**; or ASTM A529/A529M, Grade **50**; minimum **1/2-inch**- diameter steel; threaded full length or threaded a minimum of **6 inches** at each end.
 2. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
- H. Anchor Rods: Headed anchor rods as indicated in Anchor Rod Plan for attachment of metal building to foundation.
- I. Materials:
1. W-Shapes: ASTM A992/A992M; ASTM A572/A572M, Grade **50 or 55**; or ASTM A529/A529M, Grade **50 or 55**.
 2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A36/A36M; ASTM A572/A572M, Grade **50 or 55**; or ASTM A529/A529M, Grade **50 or 55**.
 3. Plate and Bar: ASTM A36/A36M; ASTM A572/A572M, Grade **50 or 55**; or ASTM A529/A529M, Grade **50 or 55**.
 4. Steel Pipe: ASTM A53/A53M, Type E or S, Grade B.
 5. Cold-Formed Hollow Structural Sections: ASTM A500, Grade B or C, structural tubing.
 6. Structural-Steel Sheet: Hot-rolled, ASTM A1011/A1011M, Structural Steel (SS), Grades **30 through 55**, or High-Strength Low-Alloy Steel (HSLAS) or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Grades **45 through 70**; or cold-rolled, ASTM A1008/A1008M, Structural Steel (SS), Grades **25 through 80**, or HSLAS, Grades **45 through 70**.
 7. Metallic-Coated Steel Sheet: ASTM A653/A653M, SS, Grades **33 through 80**, or HSLAS or HSLAS-F, Grades **50 through 80**; with **G60** coating designation; mill phosphatized.
 8. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A755/A755M.
 - a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, SS, Grades **33 through 80**, or HSLAS or HSLAS-F, Grades **50 through 80**; with **G90** coating designation.
 - b. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A792/A792M, SS, Grade **50 or 80**; with Class **AZ50** coating.
 9. Non-High-Strength Bolts, Nuts, and Washers: ASTM A307, Grade A, carbon-steel, hex-head bolts; **ASTM A563** carbon-steel hex nuts; and ASTM F844 plain (flat) steel washers.
 10. High-Strength Bolts, Nuts, and Washers, **Grade A325**: ASTM F3125/F3125M, Type 1, heavy-hex steel structural bolts; **ASTM A563**,

- Grade DH**, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
11. High-Strength Bolts, Nuts, and Washers, **Grade A490**: ASTM F3125/F3125M, Type 1, heavy-hex steel structural bolts; **ASTM A563, Grade DH**, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 12. Unheaded Anchor Rods: ASTM F1554, Grade 36.
 - a. Configuration: Straight.
 - b. Nuts: **ASTM A563** heavy-hex carbon steel.
 - c. Plate Washers: ASTM A36/A36M carbon steel.
 - d. Washers: **ASTM F436** hardened carbon steel.
 - e. Finish: Hot-dip zinc coating, ASTM F2329, Class C.
 13. Headed Anchor Rods: ASTM F1554, Grade 36ASTM A307, Grade A.
 - a. Configuration: Straight.
 - b. Nuts: **ASTM A563** heavy-hex carbon steel.
 - c. Plate Washers: ASTM A36/A36M carbon steel.
 - d. Washers: **ASTM F436** hardened carbon steel.
 - e. Finish: PlainHot-dip zinc coating, ASTM F2329, Class CMechanically deposited zinc coating, ASTM B695, Class 50.
- J. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.
1. Clean and prepare in accordance with SSPC-SP2.
 2. Coat with manufacturer's standard primer. Apply primer to primary and secondary framing to a minimum dry film thickness of **1 mil**.
 - a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of **0.5 mil** on each side.

2.4 METAL ROOF PANELS

- A. Exposed Fastener, Tapered-Rib, Metal Roof Panels 2 / A501: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch0.024-inch0.030-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
 - a. Exterior Finish: DuraTech 5000 – Premium 70% PVDF Coating with Kynar 500 or Hylar 5000 resins, or approved alternate.Two-coat fluoropolymerThree-coat fluoropolymerSiliconized polyester

- b. Color: as selected by Owner from manufacturer's range of standard panel and trim colors. Contractor to submit documentation of proposed manufacturer's standard colors to Owner for Owner's verification that available standard colors meet Owner's approval for matching closely enough the color of roof panels on existing neighboring buildings. As indicated by manufacturer's designations As selected by Architect from manufacturer's full range.
- 2. Major-Rib Spacing: Match other existing buildings on site and confirm with Owner. 6 inches 12 inches Insert dimension o.c.
 - 3. Panel Coverage: 36 inches.
 - 4. Panel Height: Match other existing buildings on site and confirm with Owner. 0.75 inch 1.125 inches 1.188 inches 1.25 inches 1.5 inches Insert dimension.
- B. Finishes:
- 1. Exposed Coil-Coated Finish:
 - a. DuraTech 5000 – Premium 70% PVDF Coating with Kynar 500 or Hylar 5000 resins, or approved alternate.
 - 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of **0.5 mil**.

2.5 METAL WALL PANELS

- A. Exposed-Fastener, Tapered-Rib, Metal Wall Panels 1 / A501: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
- 1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch 0.024-inch 0.030-inch nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
 - a. Exterior Finish: DuraTech 5000 – Premium 70% PVDF Coating with Kynar 500 or Hylar 5000 resins, or approved alternate. Two-coat fluoropolymer Three-coat fluoropolymer Siliconized polyester.
 - b. Color: as selected by Owner from manufacturer's range of standard panel and trim colors. Contractor to submit documentation of proposed manufacturer's standard colors to Owner for Owner's verification that available standard colors meet Owner's approval for matching closely enough the color of roof panels on existing neighboring buildings..

2. Major-Rib Spacing: Match other existing buildings on site and confirm with Owner. 6 inches 12 inches Insert dimension o.c.
 3. Panel Coverage: 36 inches Insert dimension.
 4. Panel Height: Match other existing buildings on site and confirm with Owner..
- B. Finishes:
1. Exposed Coil-Coated Finish:
 - a. DuraTech 5000 – Premium 70% PVDF Coating with Kynar 500 or Hylar 5000 resins, or approved alternate.
 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of **0.5 mil**.

2.6 THERMAL INSULATION

- A. Thermal Insulation for Metal Buildings:
1. Manufacturers: Subject to compliance with requirements, :
 - a. Bay Insulation Systems; a division of Bay Industries
- B. Unfaced Metal Building Insulation: ASTM C991, Type I, or NAIMA 202, glass-fiber-blanket insulation; **0.5-lb/cu. ft.** density; **2-inch-** wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.
- C. Faced, Polyisocyanurate Board Insulation: ASTM C1289, Type I (foil facing), Class 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, based on tests performed on unfaced core. Provide units tested for interior exposure without an approved thermal barrier.
- D. Retainer Strips: For securing insulation between supports, **0.025-inch** nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.
- E. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.7 PERSONNEL DOORS AND FRAMES

- A. Swinging Personnel Doors and Frames:
1. As specified in Section 081113 "Hollow Metal Doors and Frames."

2.8 WINDOWS

A. Aluminum Windows:

1. Metal building system manufacturer's standard, with self-flashing mounting fins, and as follows:
 - a. Type, Performance Class, and Performance Grade: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 and as follows:
 - 1) Horizontal-Sliding Units: Manufacturer's standard meeting the requirements indicated in Drawings.
 - b. Aluminum Extrusions: **ASTM B221**, alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than **0.064-inch** thickness at any location for main frame and sash members.
 - c. Fasteners, Anchors, and Clips: Nonmagnetic stainless steel, aluminum, or other noncorrosive material, compatible with aluminum window members, trim, hardware, anchors, and other components of window units. Fasteners are not be exposed, except for attaching hardware.
 - 1) Reinforcement: Where fasteners screw-anchor into aluminum less than **0.128 inch** thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard, noncorrosive, pressed-in, spline grommet nuts.
 - d. Hardware: Manufacturer's standard; of aluminum, stainless steel, die-cast steel, malleable iron, or bronze; including the following:
 - 1) Cam-action sweep sash lock and keeper at meeting rails.
 - 2) Spring-loaded, snap-type lock at jambs.
 - 3) Lift handles for single-hung units.
 - 4) Nylon sash rollers for horizontal-sliding units.
 - 5) Steel or bronze operating arms.
 - e. Sliding-Type Weather Stripping: Woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric; complying with AAMA 701/702.
 - f. Insect Screens: Provide removable insect screen on each operable exterior sash, with screen frame finished to match window unit, and as follows:
 - 1) Fabric: Manufacturer's standard glass-fiber mesh fabric.

B. Glazing: Comply with requirements specified in Section 088000 "Glazing."

1. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of 2.5-mm-thick clear float glass separated by a dehydrated interspace, qualified according to ASTM E2190.
 2. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201.
 - a. Provide safety glazing labeling.
 3. Factory-Glazed Fabrication: Glaze window units in the factory to greatest extent possible and practical for applications indicated. Comply with requirements in Section 088000 "Glazing."
- C. Finish:
1. Mill finish.
 2. Baked-Enamel Finish, Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness of **0.7 mil**, medium gloss.
 - a. Color: As selected by Owner.

2.9 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
 2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
 3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel sheet.
 4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch**-thick, flexible closure strips; cut or premolded to match metal roof panel

- profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
6. Thermal Spacer Blocks: Where metal panels attach directly to purlins, provide thermal spacer blocks of thickness required to provide **1-inch** standoff; fabricated from extruded polystyrene.
- C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.
1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum **1-inch**-thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- D. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.018-inch** nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.
1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
 2. Opening Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.030-inch nominal uncoated steel thickness, prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.
- E. Gutters: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.018-inch** nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum **96-inch**- long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
1. Gutter Supports: Fabricated from same material and finish as gutters.
 2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.
- F. Downspouts: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, **0.018-inch** nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum **10-foot**- long sections, complete with formed elbows and offsets.
1. Mounting Straps: Fabricated from same material and finish as gutters.

- G. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.
- H. Materials:
1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
 2. Fasteners for Metal Roof Panels:
 - a. Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless steel cap or zinc-aluminum-alloy head and EPDM sealing washer.
 - b. Self-drilling, Type 410 stainless steel or self-tapping, Type 304 stainless steel or zinc-alloy-steel hex washer head, with EPDM washer under heads of fasteners bearing on weather side of metal panels.
 3. Fasteners for Metal Wall Panels:
 - a. Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with EPDM sealing washers bearing on weather side of metal panels.
 4. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
 5. Blind Fasteners: High-strength aluminum or stainless steel rivets.
 6. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for **15-mil** dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
 7. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
 8. Metal Panel Sealants:
 - a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
 - b. Joint Sealant: ASTM C920; one part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.10 FABRICATION

- A. General: Design components and field connections required for erection to permit easy assembly.
 - 1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
 - 2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members to be free of cracks, tears, and ruptures.

- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

- C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
 - 1. Make shop connections by welding or by using high-strength bolts.
 - 2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
 - 3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
 - 4. Weld clips to frames for attaching secondary framing if applicable, or punch for bolts.
 - 5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

- D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
 - 1. Make shop connections by welding or by using non-high-strength bolts.
 - 2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

- E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
 - 1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

2.11 SOURCE QUALITY CONTROL

- A. Special Inspection: Owner will engage a qualified special inspector to perform source quality control inspections and to submit reports.
 - 1. Accredited Manufacturers: Special inspections will not be required if fabrication is performed by an IAS AC472-accredited manufacturer approved by authorities having jurisdiction to perform such Work without special inspection.
 - a. After fabrication, submit copy of certificate of compliance to authorities having jurisdiction, certifying that Work was performed according to Contract requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.
 - 1. Engage land surveyor to perform surveying.
- C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to manufacturer's written instructions and drawings.
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.
- F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
 - 1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.
 - a. Joint Type: Snug tightened or pretensioned as required by manufacturer.
- G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line.

Field bolt secondary framing to clips attached to primary framing.

1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
 2. Locate and space wall girts to suit openings such as doors and windows.
 3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- H. Steel Joists and Joist Girders: Install joists, girders, and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders," joist manufacturer's written instructions, and requirements in this Section.
1. Before installation, splice joists delivered to Project site in more than one piece.
 2. Space, adjust, and align joists accurately in location before permanently fastening.
 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
 4. Joint Installation:
 - a. Bolt joists to supporting steel framework using carbon-steel bolts unless otherwise indicated.
 - b. Bolt joists to supporting steel framework using high-strength structural bolts unless otherwise indicated. Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for high-strength structural bolt installation and tightening requirements.
 - c. Weld joist seats to supporting steel framework.
 5. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.
- I. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
1. Tighten rod and cable bracing to avoid sag.
 2. Locate interior end-bay bracing only where indicated.
- J. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- K. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

- A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.
 - 1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.
- D. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
 - a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
 - 2. Install metal panels perpendicular to structural supports unless otherwise indicated.
 - 3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Locate metal panel splices over structural supports with end laps in alignment.
 - 6. Lap metal flashing over metal panels to allow moisture to run over and off the material.
- E. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
 - 1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

- F. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
- G. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.
 - 1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

- A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
 - 1. Install ridge caps as metal roof panel work proceeds.
 - 2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.
- B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.
 - 1. Install clips to supports with self-drilling or self-tapping fasteners.
 - 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 - 3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
 - 4. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
 - 5. Rigidly fasten eave end of metal roof panels and allow ridge end free movement for thermal expansion and contraction. Predrill panels for fasteners.
 - 6. Provide metal closures at peaks, rake edges, and each side of ridge caps.
- C. Lap-Seam Metal Roof Panels: Fasten metal roof panels to supports with exposed fasteners at each lapped joint, at location and spacing recommended by manufacturer.
 - 1. Provide metal-backed sealing washers under heads of exposed fasteners

- bearing on weather side of metal roof panels.
2. Provide sealant tape at lapped joints of metal roof panels and between panels and protruding equipment, vents, and accessories.
 3. Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps and on side laps of nesting-type metal panels, on side laps of ribbed or fluted metal panels, and elsewhere as needed to make metal panels weatherproof to driving rains.
 4. At metal panel splices, nest panels with minimum **6-inch** end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.
- D. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.
- E. Metal Roof Panel Installation Tolerances: Shim and align metal roof panels within installed tolerance of **1/4 inch in 20 feet** on slope and location lines and within **1/8-inch** offset of adjoining faces and of alignment of matching profiles.

3.6 METAL WALL PANEL INSTALLATION

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
 2. Shim or otherwise plumb substrates receiving metal wall panels.
 3. When two rows of metal panels are required, lap panels **4 inches** minimum.
 4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
 5. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Pre-drill panels.
 6. Flash and seal metal wall panels with weather closures at eaves and rakes, and at perimeter of all openings. Fasten with self-tapping screws.
 7. Install screw fasteners in predrilled holes.
 8. Install flashing and trim as metal wall panel work proceeds.
 9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated on Drawings; if not indicated, as necessary for waterproofing.
 10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
 11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
- B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal

wall panels to supports with fasteners as recommended by manufacturer.

- C. Insulated Metal Wall Panels: Install insulated metal wall panels on exterior side of girts. Attach panels to supports at each panel joint using concealed clip and fasteners at maximum **42 inches** o.c., spaced not more than manufacturer's recommendation. Fully engage tongue and groove of adjacent insulated metal wall panels.
 - 1. Install clips to supports with self-tapping fasteners.
 - 2. Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels as weather seal.
- D. Installation Tolerances: Shim and align metal wall panels within installed tolerance of **1/4 inch in 20 feet**, noncumulative; level, plumb, and on location lines; and within **1/8-inch** offset of adjoining faces and of alignment of matching profiles.

3.7 THERMAL INSULATION INSTALLATION

- A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.
 - 1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
 - 2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
 - 3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
 - 4. Install blankets straight and true in one-piece lengths. Install vapor retarder over insulation, with both sets of facing tabs sealed, to provide a complete vapor retarder.
- B. Blanket Roof Insulation: Comply with the following installation method:
 - 1. Over-Framing Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal roof panels fastened to secondary framing.
 - 2. Between-Purlin Installation: Extend insulation and vapor retarder between purlins. Carry vapor-retarder-facing tabs up and over purlin, overlapping adjoining facing of next insulation course and maintaining continuity of retarder. Hold in place with bands and crossbands below insulation.
 - 3. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Install layer of filler insulation over first layer to fill space formed by metal roof

panel standoffs. Hold in place by panels fastened to standoffs.

- a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.
4. Two-Layers-between-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder between purlins. Carry vapor-retarder-facing tabs up and over purlin, overlapping adjoining facing of next insulation course and maintaining continuity of retarder. Install layer of filler insulation over first layer to fill space between purlins formed by thermal spacer blocks. Hold in place with bands and crossbands below insulation.
 - a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.
5. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
- C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.
 1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
 2. Sound-Absorption Insulation: Where sound-absorption requirement is indicated for metal liner panels, cover insulation with polyethylene film and provide inserts of wire mesh to form acoustical spacer grid.
- D. Board Wall Insulation: Extend board insulation in thickness indicated to cover entire wall. Hold in place by metal wall panels fastened to secondary framing. Comply with manufacturers' written instructions.
 1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

3.8 DOOR AND FRAME INSTALLATION

- A. General: Install doors and frames plumb, rigid, properly aligned, and securely fastened in place according to manufacturers' written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each door frame with elastomeric sealant used for metal wall panels.
- B. Personnel Doors and Frames: Install doors and frames according to NAAMM-HMMA 840. Fit non-fire-rated doors accurately in their respective frames, with the following clearances:
 1. Between Doors and Frames at Jambs and Head: **1/8 inch.**
 2. Between Edges of Pairs of Doors: **1/8 inch.**

3. At Door Sills with Threshold: **3/8 inch**.
 4. At Door Sills without Threshold: **3/4 inch**.
 5. At fire-rated openings, install frames according to, and doors with clearances specified in, NFPA 80.
- C. Sliding Service Doors: Bolt support angles to opening head members through factory-punched holes. Bolt door tracks to support angles at maximum **24 inches** o.c. Set doors and operating equipment with necessary hardware, jamb and head mold stops, continuous hood flashing, anchors, inserts, hangers, and equipment supports.
- D. Field Glazing: Comply with installation requirements in Section 088000 "Glazing."
- E. Door Hardware:
1. Install surface-mounted items after finishes have been completed at heights indicated in DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 2. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 3. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
 4. Set thresholds for exterior doors in full bed of sealant complying with requirements for concealed mastics specified in Section 079200 "Joint Sealants."

3.9 WINDOW INSTALLATION

- A. General: Install windows plumb, rigid, properly aligned, without warp or rack of frames or sash, and securely fasten in place according to manufacturer's written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each window frame with elastomeric sealant used for metal wall panels.
1. Separate dissimilar materials from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in AAMA/WDMA/CSA 101/I.S.2/A440.
- B. Set sill members in bed of sealant or with gaskets, for weathertight construction.
- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- D. Mount screens directly to frames with tapped screw clips.

3.10 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of **10 feet** with no joints allowed within **24 inches** of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than **1 inch** deep, filled with mastic sealant (concealed within joints).
- C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than **36 inches** o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- D. Downspouts: Join sections with **1-1/2-inch** telescoping joints. Provide fasteners designed to hold downspouts securely **1 inch** away from walls; locate fasteners at top and bottom and at approximately **60 inches** o.c. in between.
1. Provide elbows at base of downspouts to direct water away from building.
 2. Tie downspouts to underground drainage system indicated.

- E. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.11 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.
- B. Product will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.12 ADJUSTING

- A. Doors: After completing installation, test and adjust doors to operate easily, free of warp, twist, or distortion.
- B. Door Hardware: Adjust and check each operating item of door hardware and each door to ensure proper operation and function of every unit. Replace units that cannot be adjusted to operate as intended.
- C. Windows: Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and at weather stripping to ensure smooth operation and weathertight closure. Lubricate hardware and moving parts.

3.13 CLEANING AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.
- B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- C. Touchup Painting:
 - 1. After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
 - a. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
 - b. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
 - 2. Cleaning and touchup painting are specified in Section 099113 "Exterior

Painting" and Section 099123 "Interior Painting."

- D. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
 - 1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.
- E. Doors and Frames: Immediately after installation, sand rusted or damaged areas of prime coat until smooth and apply touchup of compatible air-drying primer.
 - 1. Immediately before final inspection, remove protective wrappings from doors and frames.
- F. Windows: Clean metal surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances. Clean factory-glazed glass immediately after installing windows.

END OF SECTION 133419

SECTION 220000 - GENERAL PLUMBING PROVISIONS**PART 1 GENERAL**

1.1 GENERAL REQUIREMENTS: All work covered under these provisions is to be “design/build” by contractor utilizing specific fixtures and materials as may be specified elsewhere in project Drawings or Specifications. Division 01 requirements apply for the work specified in this Section.

1.2 SCOPE OF WORK: The work covered by this Specification shall include designing, drawing, and furnishing all labor, materials, equipment and services to construct and install the complete plumbing system as shown on the Drawings and specified herein. Contractor is responsible for obtaining any and all permits required for work covered by this Specification. In addition to any other submittals as may be required in this Section and Related Sections, Contractor shall submit a plumbing plan to Engineer for review. Verify all conditions on the job site and lay out work accordingly.

1.3 RELATED WORK:

- A. The General Provisions apply to this Division, including but not limited to:
 - 1. Drawings and Specifications.
 - 2. Contract Modifications, addendums and change orders.
- B. Section 400, General Conditions, applies to this Division.
- C. Related work provided in Divisions 02 through 10.
- D. Related Work provided in Division 23 and 26.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. All work, installations, materials and equipment shall comply with the provision of the following codes, referenced standards, and regulations, except where more stringent requirements are shown or specified:
 - a. Oregon Plumbing Specialty Code.
 - b. Oregon Mechanical Specialty Code.
 - c. Oregon Structural Specialty Code.
 - d. Oregon Electrical Specialty Code.
 - e. Oregon Fire Code
 - f. All City, County, State and Federal applicable laws and regulations.
 - g. Regulations and standards set forth by ASME, ASHRAE, SMACNA, AGA and ARI.
 - 2. Should there be any direct conflict between Codes and the Drawings and Specifications, the Codes’ rules and regulations shall govern.
 - 3. Where two or more codes or regulations apply, the more stringent of the two shall be exercised.

4. Should the Documents indicate a condition, which will conflict with the Codes, the Contractor shall inform the Agency's Representative and refrain from installing that portion until resolved. Any work installed in violation of the Codes will be removed and correctly installed as part of the Contract work.
 5. If the Drawings and Specifications indicate a higher quality than code, the Drawings and Specifications shall govern.
 6. Electrical products shall bear the U.L. label.
- B. The entire plumbing system shall operate correctly at full capacity without objectionable noise, vibration or decrease of efficiency.
- C. Materials and Equipment:
1. Equipment furnished shall meet all requirements of the Drawings and Specifications and be suitable for the installation. Equipment not meeting all requirements will not be acceptable.
 2. Where two or more units of the same class of equipment are furnished, use products of the same manufacturer.
 3. Furnish all materials and equipment, new and of size, type and quality herein specified.
- D. Workmanship:
1. Follow manufacturers' instructions. If they are in conflict with the Drawings and Specifications, obtain clarification from the Engineer prior to beginning the work.
- E. Cutting and Patching:
1. Provide for cutting, patching and repairing for the installation of the work specified, including masonry work, concrete work, carpentry work and painting. Work shall be performed by skilled craftsmen of the respective trade.

1.5 PROJECT CONDITIONS:

- A. The locations of all utilities, wires, conduits, pipes, duct, 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.
- B. Prior to bid, contact the local utility companies to verify requirements. Provide all material and labor by utilities.
- C. The Contractor, before submitting a Bid on the work, must visit the site to become familiar with all visible existing conditions. As a result of having visited the premises, the Contractor shall be responsible for the installation of the work as it relates to such visible existing conditions. The submission of the bid will be considered an acknowledgement of the part of the Bidder of visitation to the site.

- D. The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.
- E. Coordinate exact requirements governed by actual job conditions. Check all information and report all discrepancies before fabrication work. Report changes in the time to avoid unnecessary work. Make changes as directed by Agency's Representative.

1.6 SUBSTITUTION AND PRODUCT OPTIONS:

- A. See Division 01.
- B. The use of manufacturer's names, models and numbers in the Drawings and Specifications is intended to establish style, quality, appearance and usefulness. The model numbers listed are the last available to the designer, if no longer current, substitute equipment equal to or better than that represented by the model number listed. Items noted "or equivalent" will require prior acceptance.
- C. Submit for the Agency's Representative's review, manufacturer's detailed specifications and data sheets for all proposed substitutions. Submittals shall consist of a single sheet, or specific data need for consideration of approval. All pertinent data listed in the Specifications and on the Drawings shall be furnished, including all special features. See that all submittals are in proper order, and that all equipment will fit the space provided.
- D. All requests for approval of substitutions for materials other than those specified must be submitted in accordance with Instruction to Bidder.
- E. All changes required due to product substitutions are the responsibility of the Contractor.

1.7 PROJECT RECORD DRAWINGS:

- A. Obtain drawings from Engineer.
- B. Keep Drawings clean, undamaged and up to date.
- C. Record and accurately indicate the following:
 - 1. Depths, sizes and locations of all buried and concealed piping.
 - 2. Locations of all clean-outs.
 - 3. Changes, additions and revisions due to contract modifications.
 - 4. Locations of tracer wire terminal points.
- D. Drawings to be available for Engineer review.
- E. Submit as a part of Project Closeout Documents

1.8 CONTRACT MODIFICATIONS:

- A. In addition to the requirements of the General provisions, all supplemental cost proposals for this Division of work shall be accompanied by a complete itemized breakdown of labor and materials for each item. No exceptions will be made. Contract's estimating sheets for supplemental cost proposals shall be made available upon request. Labor must be separated and allocated to each item of work. Changes or additions subject to additional compensation made without written authorization based on agreed price shall be at Contractor's own risk and expense.

1.9 STORAGE AND HANDLING

- A. Delivery: Deliver to project site with manufacturer's labels intact and legible.
- B. Handling: Avoid damage.
- C. Storage: Store material inside, protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

1.10 WARRANTY:

- A. Provide a written guaranty covering the work of this Division for a period of one calendar year from the date of acceptance of the entire project as required by the General Provisions.
- B. Provide manufacturer's written warranties for material and equipment furnished under this Division insuring parts and labor for a period of one year from the date of acceptance of the entire project.
- C. Correct warranty items promptly upon notification.

1.11 OPERATIONS AND MAINTENANCE DATA:

- A. Prior to final inspection, provide three (3) copies of manufacturer's maintenance manuals for each piece of equipment or items requiring service. Manual shall include manufacturer's operation and maintenance instruction manuals and parts list for each piece of equipment or item requiring servicing. Include in the manual manufacturer's service data, wiring diagrams and parts lists for all major items of equipment, valve charts, balancing data and any additional equipment added by contract modification. Comply with provisions of Section 01 7800 where applicable.
- B. Submit bound in 8-1/2 x 11 inch text pages, three ring binders with durable plastic covers.
- C. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple

binders are required.

- D. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titling clearly printed under reinforced laminated plastic table.

1.13 SUBMITTALS:

- A. Design Drawings: Indicate the general layout of the piping and various items of equipment and fixtures, suitable for submission for a plan review by the authority having jurisdiction.
- B. Product Data:
 - 1. Submit for review manufacturer's detailed shop drawings, specifications and stat sheets for all equipment to be furnished, as well as any wiring diagram showing field installed wiring and devices. Arrangement of plumbing fixtures has been based on items of specific manufacturer intended as diagrammatic only.
 - 2. Indicate construction, capacities, accessories, etc. Manufacturer's abbreviations or codes are not acceptable.
 - 3. List the name of the motor manufacturer for each piece of equipment.
- C. Submission Requirements:
 - 1. Shop Drawings and Product Data:
 - a. Refer to Division 01
 - 2. Sample: Submit samples required by each Section of Division 22 at the same time that shop drawings and product data are submitted.
- D. It shall be the Contractor's responsibility to:
 - 1. See that all submittals are in proper order.
 - 2. Ensure that all equipment will fit in the space provided.
 - 3. Assure that all deviation from Drawings and Specification are specifically noted and called to the attention of the Engineer/Contracting Officer in the submittals. Failure to comply will void approval automatically.
 - 4. Deviation, discrepancies, and conflicts between the submittals and the contract documents discovered prior to or after the review process shall not relieve the Contractor of this responsibility to comply with the contract documents.

1.14 START-UP:

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Agency's Representative seven days prior to start-up of each item.
- C. Verify that each piece of equipment of system has been checked prior to start-up for proper lubrication, drive rotation, belt tension, control sequence, or other conditions, which may cause damage.
- D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.

- E. Verify that wiring and support components for equipment are completed and tested.
- F. Execute start-up under supervision of responsible manufacturer's representative or Contractor's personnel in accordance with manufacturer's instructions.

1.15 FEES, PERMITS AND INSPECTIONS: The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.

1.16 DEFINITIONS

- A. "Furnish: Means to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations.
- B. "Install": Describes operations at project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.
- C. "Provide": Means to furnish and Install, complete and ready for intended use.

PART 2 PRODUCTS

2.1 MATERIAL:

- A. All materials and products used for construction shall be new, of the best grade, and latest products as listed in printed catalog data. All articles of a kind shall be the standard product of a single manufacturer. Trade names and manufacturers names denote a character and quality of equipment desired and shall not be construed as limiting competition.
- B. Asbestos: Do not use products made of or containing asbestos.

2.2 QUALITY ASSURANCE

- A. Refer to Division 01 Material and Equipment for information regarding available alternatives to materials and equipment specified herein. Product listings are for informational purposes only and establish a general standard of quality.
- B. Provide products which are compatible with other portions of the work and provide products with the proper and correct power and fuel burner characteristics and similar adaptations for the project.

PART 3 EXECUTION

3.1 INSPECTION:

- A. All work and materials are subject to field observation at any and all times by the Agency's Representative.
- B. The Contractor shall notify the Agency's Representative a minimum of two days prior to testing any piping system which must be witnessed and accepted before it is covered up or enclosed.
- C. Cover or otherwise suitably protect equipment and materials stored on the job site.

3.2 CLEANING

- A. General: Clean plumbing equipment, fixtures, piping of stampings and markings (except those required by codes), iron cuttings, and other refuse.
- B. Painted Surfaces: Clean scratched or marred painted surfaces of rust or other foreign mater and paint with matching color industrial enamel, except as otherwise noted.
- C. Before operating any equipment or systems, make thorough check to determine that systems have been flushed and cleaned as required and equipment has been properly installed, lubricated and serviced. Check factory instructions to see that installations have been made accordingly and that recommended lubricants have been used.
- D. Use particular care in lubricating bearings to avoid damage by over-lubrication and blowing out seals. Check equipment for damage that may have occurred during shipment, after delivery or during installation. Repair damaged equipment as approved or replace with new equipment.

3.3 LAYOUT AND COORDINATION

- A. Site Examination: Before starting work, carefully examine site and all contract Drawings so as to 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.
- B. The existence of any wires, conduits, pipes, ducts or other service facilities are not necessarily shown. It will be the duty of the Contractor to visit the site and make exact determination of the existence of any such facilities prior to submitting a bid. It is understood that the Contractor will be responsible for making the exact determination of the location and condition of these facilities.
- C. The location of all utilities indicated on the plans is taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown may be present.
- D. Sleeves, Insets, 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.

E. Coordination:

1. 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.
2. Cooperate with other trades in furnishing material and information for sleeves, bucks, chases, mountings, backing, foundations and wiring required for installation of mechanical items.
3. 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.

F. 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.

G. Water supply header piping shall be looped within the pipe chase (mechanical corridor) to ensure adequate pressure and flow rate through the entire system during peak use.

3.4 TEMPORARY FACILITIES AND CONTROLS

- A. Comply with Division 01 requirements.
- B. Permanent plumbing systems' equipment utilized for temporary facilities shall be started with all controls and safeties installed and operational. Start-up shall be done by a factory approved mechanic only.
- C. Agency'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.

3.5 CLOSEOUT

- A. General: Refer to the Division 01 sections for general closeout requirements. Calibrate all equipment requiring same.
- B. Record Drawings: Submit record set of drawings required in Division 01, Submittals and as previously specified in this Section.
- C. 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 Engineer present, and with the Agency'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 strainers, excessively worn parts and similar expendable items of the work.

- D. Operation and Instruction: Provide up to eight (8) hours of on-site training to Agency's personnel on all mechanical systems and equipment. Training shall include maintenance, lubrication, troubleshooting and repair. Contractor shall provide necessary written manuals and training aides explaining operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety and similar features of the installed system. Three (3) copies of written manuals shall be left with Agency at end of training.

END OF SECTION 220000

SECTION 220300 - PLUMBING SYSTEMS

PART 1 GENERAL

1.1 WORK INCLUDED

- A. The requirement of this section applies to the plumbing system.

1.2 QUALITY ASSURANCE

- A. Codes: Section 22 0000.
- B. Fixtures: By same manufacturer for each product specified throughout. Color shall be stainless steel unless indicated otherwise.
- C. Trim: By same manufacturer for each product specified throughout.

1.3 SUBMITTALS

- A. Submit product data under provisions of Section 22 0000.
- B. Include fixtures, sizes, utility sizes, trim, and finishes.
- C. Submit for:
 - 1. All fixtures.
 - 2. Drains.
 - 3. Water Heaters.
 - 4. Grease interceptors.
 - 5. Pumps.
 - 6. Hose bibs.
 - 7. Hose reels.
 - 8. Oil Water Separators.

1.4 PLUMBING FIXTURES

- A. General: Provide factory fabricated fixtures of type, style and material indicated on the plumbing fixture connection schedule. For each type fixture, provide manufacturer's standard trim, carrier, seats and valves as scheduled or as recommended by manufacturer as required for complete installation.
 - 1. Fixtures: Complete with fittings, supports, fastening devices, faucets, valves, traps, stops and additional devices required.

2. Exposed IPS Piping and Tubing: Brass, chrome plated.
3. Escutcheons: Brass, chrome plated.
4. Fixtures Locations: As shown on Architectural Drawings.
5. Stops: Stops installed on each supply pipe at each fixture accessibly located with wall escutcheons.
6. Showers, Public lavatories, Interior Faucets: Provide with flow control device per code.

1.5 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 22 0000.

PART 2 PRODUCTS

2.1 INTERIOR PLUMBING MATERIALS

- A. Cleanouts:
 1. Manufacturer: J.R. Smith, Jonespec, Zurn, Wade, or accepted substitute.
 2. Types:
 - a. Tile Floor Cleanouts: Smith 4053-U with square heavy-duty nickel bronze top, taper thread, bronze plug, and vandalproof screws.
 - b. Carpeted Floor Cleanout: Smith 4023-U-X with round heavy-duty nickel bronze top, taper thread, bronze plug, carpet clamping device and vandalproof screws.
 - c. Concrete Floor Cleanout: Smith 4023-U with round heavy-duty nickel bronze top, stainless steel shallow cover and vandalproof screws.
 - d. Wall Cleanouts: Smith 4472-U, bronze ferrule with raised head bronze plug, stainless steel shallow cover and vandalproof screws.
 - e. Outside Area Walks and Drives: Smith 4253-U-G with galvanized cast iron body, top secured with vandalproof screws, taper thread and bronze plug. Install in 18" x 18" x 6" deep concrete pad flush with grade.
- B. Flashing: Minimum 4# sheet lead; to extend horizontally 10" from edge of vent penetrations or rain drain body and vertically 12" minimum up from roof turned

over and down into hub of vent or finished with bronze cap providing counterflashing for screwed pipe.

- C. Shock Arrester: Precharged bellows or sealed piston type manufactured to meet PDI WH-201 and ASSE 1010 Standards. Size in accordance with PDI procedures. Jonespec, J.R. Smith, PPP, Wade, Zurn, or accepted substitute.
- D. Traps: Provide traps on all fixtures except fixtures with integral traps. Exposed traps chromium plated cast brass or 17 gauge chrome plated brass tubing. American Standard, Kohler, Chicago, Brasskraft, Eastman, Speedway, McGuire or approved substitute.
- E. Supplies and Stops: First quality, chrome plated with brass stems. Stops: loose key type. American Standard, Kohler, Chicago, Brasskraft, Eastman, Speedway, McGuire or approved substitute.
- F. Thermometers: 3-inch diameter bi-metal dial thermometer with stainless steel case, white dial, black numbers with 4-inch stainless steel stem and brass separable socket. Provide back or bottom connections as required. 0°F to 200°F range. Weiss, Palmer, Ashcroft, Terice, Marshalltown, Weksler or approved substitute.
- G. Pressure Gauges: Single arm guide gauge with 0 to 160 range, 20 PSI intervals and 2 PSI incremental graduations. Aluminum dial with 1 percent accuracy and low bottom connections for wall mounting. Weiss, Palmer, Ashcroft, Terice, Marshalltown, Weksler or approved substitute.

2.2 ELECTRIC TANKLESS COMMERCIAL WATER HEATERS:

- A. Electric tankless commercial water heater(s), UL 499, sized for low flow constant temperature requirements, low flow activation, and overheat protection.
 - 1. Heat Exchanger: Copper tubing with brazed brass fittings and large internal passageways for minimal pressure drop. NSF 61 barrier materials for potable water, without storage capacity.
 - 2. Rating: 150 psig.
 - 3. Heating Element: Heavy duty, low-watt density Incoloy 800 sheathed resistive element.
 - 4. Mounting: Wall mounted.
 - 5. Capacity:
 - a. Temperature Rise at Flow Rate: 60 deg F at 10 gpm plus flow from hot hose.

- b. Adjustable Temperature Setpoint: 110 deg F.
- 6. Low Flow Activation: 0.25 GPM
- 7. High Flow Capacity: Combined high flow rate of one or more heaters capable of meeting hot water demands of the greater of all restroom lavatories operating simultaneously or all but one restroom lavatory operating simultaneously with the full flow from one 5/8 inch diameter hose.
- 8. Manufacturer: Hubbell, Keltech, or approved alternate.
- 9. Provide a recirculating piping and pump system between water heater(s) and lavatories, and arrange system so that one or more heaters will activate only as required to meet heated water flow demands.

2.3 PRIMING VALVES:

- A. Smith 2699, Wade, Zurn, PPP or accepted substitute. Locate in closets, under counters or in walls behind Milcor or access panels as specified in Section 15050. Use copper for all underground priming lines.

2.4 PLUMBING FIXTURES

- A. Stops: Furnish stop valves for all fixtures. In-line non-adjustable, located in pipe chase (pattern to fit installation). Kohler, Speedway, Chicago, Eastman, Brasskraft, or accepted substitute.
- B. Water Closet
 - 1. Install elongated tank type ADA water closet, fully glazed trapway, 1.28GPF, chrome handle. Provide with handle on accessible side. Elongated open front seat.
 - 2. Material: White Vitreous China.
 - 3. Manufacturer & Model: Coordinate with Owner to match existing in adjacent building.
- C. Lavatories
 - 1. Lavatory: ADA-compliant self-rimming sink, integrated overflow. Include compatible wall hanger, where required.
 - 2. Hardware: 0.5GPM faucet, ADA-compliant, chrome plate finish, grid drain.
 - 3. Shields: Truebro Lav-Guard MDL 101-E-Z P-TRAP, water supply lines, stop valves covers, ADA Compliant, soft white vinyl.
 - 4. Manufacturer & Model: Coordinate with Owner to match existing in adjacent building.

5. Material: White Vitreous China.

D. Sinks

1. Sink: Undermount, self-rimming, dual or single basin, rounded corners, 18ga stainless steel, coated underside for insulating sound and reducing condensation inside bowl dimensions. Integrated drain and basket strainer, dual basin
2. Hardware: Single lever faucet, chrome plate finish, provide 1.5 gpm ADA-compliant multifunction pull down spray head, ceramic disc valve in break rooms.
3. Material: Stainless Steel.
4. Manufacturer & Model: Coordinate with Owner .

E. Floor Drains

1. FD-1 Cast iron body, double drainage flange with weep holes, priming connection, nickel bronze strainer finish, flashing clamp device, adjustable or insert type strainer. Comply with ANSI.
2. Basis of Design: Smith Model 2005-A, Josam, Zurn or accepted substitute.

F. Floor Drains Integral Cleanout

1. FD-2 Cast-Iron body, double drainage flange with weep holes, priming connection, nickel bronze strainer finish, flashing clamp device, adjustable or insert type strainer. Comply with ANSI.
2. Basis of Design: Manufacturer Model, Smith Model 2040.

2.5 HOSE BIBBS

- A. Freezeless
- B. For hot, cold, or hot and cold water as indicated.
- C. Basis of design, Manufacturer Model, Woodford V22CP-4-MH for hot and cold water and similar for hot or cold water only.

2.6 SURGE TANK

- A. As required. Coordinate with Agency.

2.7 PIPE SLEEVES

- A. Interior Wall Sleeves: 12 gage galvanized steel, flush with wall on both sides.
- B. Interior Floor Sleeves: 12 gage galvanized steel and extend 2-inches above finished floor.

- C. Exterior Wall Sleeves: Cast iron, flush with wall on both sides.
- D. On Grade Floor Sleeves: Same as exterior wall sleeves.

2.8 ESCUTCHEONS

- A. Brass material, chrome plated finish. Size sufficient to cover all pipe openings through wall, floor or ceiling. Set screw or spring to secure to pipe.

2.9 UNIONS

- A. Steel pipe union shall be 150-pound malleable iron, brass to iron seat, ground joint, black or galvanized to match pipe.
- B. Copper pipe union shall be 200 psig working pressure. Bronze body. Solder ends.
- C. Insulating unions shall be 250 psig working pressure. Pipe ends and material to match piping. Electric current below 1% of galvanic current. Gasket material as recommended by manufacturer. Epco or approved.

PART 3 EXECUTION

3.1 INSPECTION

- A. Confirm location and size of fixtures and openings before rough- in and installation.
- B. Verify adjacent construction is ready to receive rough-in work of this Section.
- C. Review rough-in locations of potable water and waste piping systems to verify actual locations prior to installing fixtures.

3.2 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Install components level and plumb.
- C. Install and secure fixtures in place with wall carriers and bolts. Install fixtures as shown on drawings.
 - 1. Support all wall hung water closets and urinals on heavy duty, concealed, chair carriers mounted to floor structure.
 - 2. Support wall hung lavatories mounted on stud partitions on heavy concealed wall brackets bolted to a steel plate anchored firmly to studs with bolts. Plate to extend one stud each way beyond fixture mounting point width. Floor mounted concealed arm carriers approved.
- D. Cleanouts

1. Where required by code, at each change of sewer direction 45 degrees or greater and more than 10' long, at end of each branch or main and spaced not greater than 100' apart, as required by code and/or as shown on Drawings.
- E. Install all devices in accordance with manufacturer's written instructions and recommendations.
- F. Provide waste piping to plumbing fixtures and drains, with approved trap, of sizes indicated; but in no case smaller than required by code.
- G. Mechanical Equipment Connections: Connect piping system to mechanical equipment as indicated. Comply with equipment manufacturer's instructions. Provide shutoff valve and union for each connection. Provide drain valve on drain connection.
- H. Water Hammer Arrestors: Install in upright position, in locations and of sizes per PDI WH-201.
- I. Arrange locations of valves, unions, drains and other components to provide for ease of maintenance, repair or service. Size access panels and locate to provide working spaces for all devices served by access.
- J. Provide valves and shock arrestors where required by code and where otherwise indicated in Specifications and on Drawings.
- K. Fixtures:
1. Install plumbing fixtures where shown and at appropriate heights; in accordance with fixture manufacturer's written instructions, roughing-in drawings and industry standards.
 2. Set and connect to soil, waste, vent and water piping in neat, uniform manner. Connections to be plumb and set at right angles to floor and wall unless otherwise required.
 3. Seal fixtures mounted on floors and walls with sealant compounds as directed by architect.
 4. Set mixing valves of lavatories to limit temperature to 110°F.
- L. Stops: Screwdriver or loose key stops to be installed in hot and cold supply pipe to each fixture accessibly located.
- M. Floor Drains:
1. Install drains in accordance with manufacturer's written instructions. See

Drawings for locations.

2. Install floor drains at low points of areas to be drained or as indicated. Grate to be flush with finished floor. Set floor sinks as required by local codes.
3. Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
4. Prime all drains. Refer to Drawings. Contractor to prime all drain traps at close of construction. Do not utilize trap primers for fill. Coordinate with local authorities for exact requirements.

N. Hose Bibbs:

1. Install where shown, in accordance with manufacturer's installation instructions.

3.3 ADJUSTING AND CLEANING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow
- B. At completion clean plumbing fixtures and equipment.
- C. Solidly attach water closets to floor with lag screws. Lead flashing is not intended to hold fixture in place.

3.4 INSPECTION

- A. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
- B. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Engineer. Remove cracked or dented units and replace with new units.

3.5 ELECTRIC WATER HEATERS

- A. Install in accordance with manufacturer's installation instructions.
- B. Connect hot and cold water piping to units with shutoff valves and unions. Connect recirculating water line to unit with shutoff valve, check valve and

union.

- C. Anchor heaters to structure in accordance with manufacturer's installation instructions.
- D. See drawings for approximate locations.

END OF SECTION 220300

SECTION 221319.13 - SANITARY DRAINS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Floor drains.

1.2 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene styrene.
- B. FRP: Fiberglass-reinforced plastic.
- C. HDPE: High-density polyethylene.
- D. PE: Polyethylene.
- E. PP: Polypropylene.
- F. PVC: Polyvinyl chloride.

1.3 ACTION SUBMITTALS

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

PART 2 - PRODUCTS

2.1 DRAIN ASSEMBLIES

- A. Sanitary drains shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14 for plastic sanitary piping specialty components.

2.2 FLOOR DRAINS

- A. Cast-Iron Floor Drains
 - 1. Manufacturers: Subject to compliance with requirements, available

manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Commercial Enameling Company
 - b. Jay R. Smith Mfg Co; a division of Morris Group International
 - c. Josam Company
 - d. MIFAB, Inc
 - e. Prier Products, Inc.
 - f. Sioux Chief Manufacturing Company, Inc.
 - g. Wade; a subsidiary of McWane Inc.
 - h. WATTS; A Watts Water Technologies Company
 - i. Whitehall Manufacturing; a division of Morris Group International
 - j. Zurn Industries, LLC
2. Standard: ASME A112.6.3.
 3. Pattern: Floor drain.
 4. Body Material: Gray iron.
 5. Outlet: Bottom.
 6. Top or Strainer Material: Bronze.
 7. Top Shape: Round.
 8. Top Loading Classification: Heavy Duty.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
 1. Position floor drains for easy access and maintenance.
 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage.
 3. Set with grates depressed according to the following drainage area radii:
 - a. Radius, **30 Inches** or Less: Equivalent to 1 percent slope, but not less than **1/4-inch** total depression.
 - b. Radius, **30 to 60 Inches**: Equivalent to 1 percent slope.
 - c. Radius, **60 Inches** or Larger: Equivalent to 1 percent slope, but not greater than **1-inch** total depression.
 4. Install floor-drain flashing collar or flange, so no leakage occurs between drain and adjoining flooring.
 5. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

3.2 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 221319.13

SECTION 230000 - HEATING, VENTILATION, AND AIR CONDITIONING PROVISIONS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS: All work covered under these provisions is to be “design/build” by contractor utilizing specific equipment and materials as may be specified elsewhere in project Drawings or Specifications. Division 01 requirements apply for the work specified in this Section.

1.2 SCOPE OF WORK: The work covered by this Specification shall include designing, drawing, and furnishing all labor, materials, equipment and services to construct and install the complete mechanical system as shown on the Drawings and specified herein. Contractor is responsible for obtaining any and all permits required for work covered by this Specification. In addition to any other submittals as may be required in this Section and Related Sections, Contractor shall submit a mechanical plan to Engineer for review. Verify all conditions on the job site and lay out work accordingly.

1.3 RELATED WORK:

- A. The General Provisions apply to this Division, including but not limited to:
 - 1. Drawings and Specifications.
 - 2. Contract Modifications, addendums and change orders.
- B. Section 400, General Conditions, applies to this Division.
- C. Related work provided in Divisions 02 through 10.
- D. Related Work provided in Division 22 and 26.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. All work, installations, materials and equipment shall comply with the provision of the following codes, referenced standards, and regulations, except where more stringent requirements are shown or specified:
 - a. Oregon Plumbing Specialty Code.
 - b. Oregon Mechanical Specialty Code.
 - c. Oregon Structural Specialty Code.
 - d. Oregon Electrical Specialty Code.
 - e. Oregon Fire Code
 - f. All City, County, State and Federal applicable laws and regulations.
 - g. Regulations and standards set forth by ASME, ASHRAE, SMACNA, AGA and ARI.
 - 2. Should there be any direct conflict between Codes and the Drawings and Specifications, the Codes’ rules and regulations shall govern.

3. Where two or more codes or regulations apply, the more stringent of the two shall be exercised.
 4. Should the Documents indicate a condition, which will conflict with the Codes, the Contractor shall inform the Agency's Representative and refrain from installing that portion until resolved. Any work installed in violation of the Codes will be removed and correctly installed as part of the Contract work.
 5. If the Drawings and Specifications indicate a higher quality than code, the Drawings and Specifications shall govern.
 6. Electrical products shall bear the U.L. label.
- B. The entire mechanical system shall operate correctly at full capacity without objectionable noise, vibration or decrease of efficiency.
- C. Materials and Equipment:
1. Equipment furnished shall meet all requirements of the Drawings and Specifications and be suitable for the installation. Equipment not meeting all requirements will not be acceptable.
 2. Where two or more units of the same class of equipment are furnished, use products of the same manufacturer.
 3. Furnish all materials and equipment, new and of size, type and quality herein specified.
- D. Workmanship:
1. Follow manufacturers' instructions. If they are in conflict with the Drawings and Specifications, obtain clarification from the Engineer prior to beginning the work.
- E. Cutting and Patching:
1. Provide for cutting, patching and repairing for the installation of the work specified, including masonry work, concrete work, carpentry work and painting. Work shall be performed by skilled craftsmen of the respective trade.

1.5 PROJECT CONDITIONS:

- A. The locations of all utilities, wires, conduits, pipes, duct, 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.
- B. Prior to bid, contact the local utility companies to verify requirements. Provide all material and labor by utilities.
- C. The Contractor, before submitting a Bid on the work, must visit the site to become familiar with all visible existing conditions. As a result of having visited the premises, the Contractor shall be responsible for the installation of the work as it relates to such visible existing conditions. The submission of the bid will

be considered an acknowledgement of the part of the Bidder of visitation to the site.

- D. The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.
- E. Coordinate exact requirements governed by actual job conditions. Check all information and report all discrepancies before fabrication work. Report changes in the time to avoid unnecessary work. Make changes as directed by Agency's Representative.

1.6 SUBSTITUTION AND PRODUCT OPTIONS:

- A. See Division 01.
- B. The use of manufacturer's names, models and numbers in the Drawings and Specifications is intended to establish style, quality, appearance and usefulness. The model numbers listed are the last available to the designer, if no longer current, substitute equipment equal to or better than that represented by the model number listed. Items noted "or equivalent" will require prior acceptance.
- C. Submit for the Agency's Representative's review, manufacturer's detailed specifications and data sheets for all proposed substitutions. Submittals shall consist of a single sheet, or specific data need for consideration of approval. All pertinent data listed in the Specifications and on the Drawings shall be furnished, including all special features. See that all submittals are in proper order, and that all equipment will fit the space provided.
- D. All requests for approval of substitutions for materials other than those specified must be submitted in accordance with Instruction to Bidder.
- E. All changes required due to product substitutions are the responsibility of the Contractor.

1.7 PROJECT RECORD DRAWINGS:

- A. Obtain drawings from Engineer.
- B. Keep Drawings clean, undamaged and up to date.
- C. Record and accurately indicate the following:
 - 1. Depths, sizes and locations of all buried and concealed piping.
 - 2. Locations of all equipment.
 - 3. Changes, additions and revisions due to contract modifications.
- D. Drawings to be available for Engineer review.

- E. Submit as a part of Project Closeout Documents

1.8 CONTRACT MODIFICATIONS:

- A. In addition to the requirements of the General provisions, all supplemental cost proposals for this Division of work shall be accompanied by a complete itemized breakdown of labor and materials for each item. No exceptions will be made. Contract's estimating sheets for supplemental cost proposals shall be made available upon request. Labor must be separated and allocated to each item of work. Changes or additions subject to additional compensation made without written authorization based on agreed price shall be at Contractor's own risk and expense.

1.9 STORAGE AND HANDLING

- A. Delivery: Deliver to project site with manufacturer's labels intact and legible.
- B. Handling: Avoid damage.
- C. Storage: Store material inside, protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

1.10 WARRANTY:

- A. Provide a written guaranty covering the work of this Division for a period of one calendar year from the date of acceptance of the entire project as required by the General Provisions.
- B. Provide manufacturer's written warranties for material and equipment furnished under this Division insuring parts and labor for a period of one year from the date of acceptance of the entire project.
- C. Correct warranty items promptly upon notification.

1.11 OPERATIONS AND MAINTENANCE DATA:

- A. Prior to final inspection, provide three (3) copies of manufacturer's maintenance manuals for each piece of equipment or items requiring service. Manual shall include manufacturer's operation and maintenance instruction manuals and parts list for each piece of equipment or item requiring servicing. Include in the manual manufacturer's service data, wiring diagrams and parts lists for all major items of equipment, valve charts, balancing data and any additional equipment added by contract modification. Comply with provisions of Section 01 7800 where applicable.
- B. Submit bound in 8-1/2 x 11 inch text pages, three ring binders with durable plastic covers.
- C. Prepare binder covers with printed title "OPERATION AND MAINTENANCE

INSTRUCTIONS”, title of project, and subject matter of binder when multiple binders are required.

- D. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titling clearly printed under reinforced laminated plastic table.

1.13 SUBMITTALS:

- A. Design Drawings: Indicate the general layout of the equipment and ducting, suitable for submission for a plan review by the authority having jurisdiction.
- B. Product Data:
 - 1. Submit for review manufacturer’s detailed shop drawings, specifications and stat sheets for all equipment to be furnished, as well as any wiring diagram showing field installed wiring and devices. Arrangement of mechanical fixtures has been based on items of specific manufacturer intended as diagrammatic only.
 - 2. Indicate construction, capacities, accessories, etc. Manufacturer’s abbreviations or codes are not acceptable.
 - 3. List the name of the motor manufacturer for each piece of equipment.
- C. Submission Requirements:
 - 1. Shop Drawings and Product Data:
 - a. Refer to Division 01
 - 2. Sample: Submit any samples required at the same time that shop drawings and product data are submitted.
- D. It shall be the Contractor’s responsibility to:
 - 1. See that all submittals are in proper order.
 - 2. Ensure that all equipment will fit in the space provided.
 - 3. Assure that all deviation from Drawings and Specification are specifically noted and called to the attention of the Engineer/Contracting Officer in the submittals. Failure to comply will void approval automatically.
 - 4. Deviation, discrepancies, and conflicts between the submittals and the contract documents discovered prior to or after the review process shall not relieve the Contractor of this responsibility to comply with the contract documents.

1.14 START-UP:

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Agency’s Representative seven days prior to start-up of each item.
- C. Verify that each piece of equipment of system has been checked prior to start-up for proper lubrication, drive rotation, belt tension, control sequence, or other conditions, which may cause damage.
- D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.

- E. Verify that wiring and support components for equipment are completed and tested.
- F. Execute start-up under supervision of responsible manufacturer's representative or Contractor's personnel in accordance with manufacturer's instructions.

1.15 FEES, PERMITS AND INSPECTIONS: The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.

1.16 DEFINITIONS

- A. "Furnish: Means to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations.
- B. "Install": Describes operations at project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.
- C. "Provide": Means to furnish and Install, complete and ready for intended use.

PART 2 PRODUCTS

2.1 MATERIAL

- A. All materials and products used for construction shall be new, of the best grade, and latest products as listed in printed catalog data. All articles of a kind shall be the standard product of a single manufacturer. Trade names and manufacturers names denote a character and quality of equipment desired and shall not be construed as limiting competition.
- B. Asbestos: Do not use products made of or containing asbestos.

2.2 QUALITY ASSURANCE

- A. Refer to Division 01 Material and Equipment for information regarding available alternatives to materials and equipment specified herein. Product listings are for informational purposes only and establish a general standard of quality.
- B. Provide products which are compatible with other portions of the work and provide products with the proper and correct power and fuel burner characteristics and similar adaptations for the project.

2.3 BASIC FUNCTION

- A. Provide artificial means of controlling temperature, relative humidity, velocity, and direction of air motion in the interior spaces enclosed by the shell, and reduction of airborne odors, particulates, and contaminant gases.
- B. Provide a complete system for each room composed of a ducted commercial system with heating, ventilation, and exhaust capabilities.
- C. Heat source shall be from the building's electric service.
- D. Space temperature: Provide a system capable of maintaining a temperature of 60 degrees Fahrenheit unless a lower temperature is specified by Agency.
- E. Provide sufficient ventilation to comply with code and to obtain acceptable indoor quality, determined using either the Ventilation Rate Procedure or the Indoor Air Quality Procedure of ANSI/ASHRAE 62.1-2007.
- F. Locate outside air intakes away from any air contaminants in accordance with ANSI/ASHRAE Standard 62.1 and applicable codes.
- G. Bases of design: Manufacturer Model, Greenheck MSCF

2.4 OPERATION AND MAINTENANCE

- A. Maintenance Access
 - 1. All equipment shall be located to maintain ease of access.
 - 2. Equipment utilities shall be routed to allow for access to equipment and replacement without removal of utilities.
 - 3. Equipment shall be located in area which will allow for complete removal and replacement without demolition to building infrastructure.
 - 4. Provide access doors for access to all enclosed equipment.

2.8 SPLIT-SYSTEM VRV AIR CONDITIONERS

- A. Quality assurance
 - 1. Performance requirements: seasonal energy efficiency ratings (seer) not less than prescribed by ASHRAE 90.1 and 2021 Oregon Energy Efficiency Specialty Code, when used in combination with compressors and evaporator coils when tested according to ari 210/240 and unit shall be labeled as such
 - 2. Insulation and adhesives: meet requirements of NFPA 90a.
- B. Warranty
 - 1. Furnish standard manufacturing's warranty for the complete equipment package.
- C. Split System Air Conditioning Units
 - 1. Manufacturer: Daikin or approved alternate
 - 2. Product description: Split system consisting of indoor fan coil unit and outdoor cooling condensing unit including cabinet, evaporator fan, refrigerant fan coil, compressor, refrigeration circuit, cooling condenser,

air filter, controls, unit accessories and refrigeration specialties.

D. Indoor Air Handler / Fan Coil Unit

1. Evaporator coil: constructed of copper tubes expanded onto aluminum fins. Factory leak tested under water. Sloped condensate drain pan constructed from noncorrosive materials.

E. Outdoor Condensing Unit

1. General: Factory assembled and tested air-cooled condensing unit, consisting of casing, compressor, condensers, coils, condenser fans and motors, and unit control.
2. Unit Casting: exposed casing surfaces constructed of rust-proof mild steel with manufacturer's standard baked enamel finish. Design for outdoor installation and complete with weather protection for components and controls, condenser fans, motors and drives
3. Compressor: variable speed swing inverter-driven compressor, resiliently mounted, with permanent lubrication and internal motor overload protection.
4. Condenser Coil: nonferrous construction with corrugated fin tube, factory leak and pressure tested.
5. Refrigeration Specialties: furnish the following for each circuit:
 - Charge of compressor oil.
 - Holding charge of refrigerant.
 - Charging valve.
 - Pressure relief device

F. Controls

1. Thermostat: Seven day programmable electronic space thermostat for each zone and onboard thermostatic controls for air handlers. Thermostat shall be capable of manual override of schedules, that return to checked setpoint after a period of time. Thermostat shall be capable of controlling continuous supply fan operation during occupied mode.
2. All wiring shall be installed in conduit unless otherwise specified by

manufacturer. Communication and control wiring shall be installed to manufacturer's specifications and meet requirements of electrical specification.

G. Installation indoor fan coil unit

1. Install fan coil unit using equipment manufacturer mounting hardware and follow manufacturers installation instruction. Install condensate piping and route from drain pan to discharge location shown on plans. Install components furnished loose for field mounting. Install connection to electrical power wiring according to electrical drawings.

H. Installation outdoor heat pump condensing unit

1. Install refrigerant piping from fan coil/air handling unit to outdoor condensing unit. Install refrigerant specialties furnished with unit. Evacuate refrigerant piping and stall initial charge of refrigerant. Install electrical devices furnished lose for field mounting. Install control wiring between fan coil unit, condensing unit, and field installed accessories. Install connection to electrical power wiring according to electrical drawings. Comply with manufacture's installation instructions, performing each step in sequence.
2. Maintain one set of manufacturer's installation instructions at project site during installation and until completion of construction.

PART 3 EXECUTION

3.1 INSPECTION:

- A. All work and materials are subject to field observation at any and all times by the Agency's Representative.
- B. The Contractor shall notify the Agency's Representative a minimum of two days prior to testing any piping system which must be witnessed and accepted before it is covered up or enclosed.
- C. Cover or otherwise suitably protect equipment and materials stored on the job site.

3.2 CLEANING

- A. General: Clean mechanical equipment, fixtures, piping of stampings and markings (except those required by codes), iron cuttings, and other refuse.
- B. Painted Surfaces: Clean scratched or marred painted surfaces of rust or other foreign mater and paint with matching color industrial enamel, except as otherwise noted.
- C. Before operating any equipment or systems, make thorough check to determine that systems have been flushed and cleaned as required and equipment has been properly installed, lubricated and serviced. Check factory instructions to see that installations have been made accordingly and that recommended lubricants have been used.
- D. Use particular care in lubricating bearings to avoid damage by over-lubrication and blowing out seals. Check equipment for damage that may have occurred during shipment, after delivery or during installation. Repair damaged equipment as approved or replace with new equipment.

3.3 LAYOUT AND COORDINATION

- A. Site Examination: Before starting work, carefully examine site and all contract Drawings so as to 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.
- B. The existence of any wires, conduits, pipes, ducts or other service facilities are not necessarily shown. It will be the duty of the Contractor to visit the site and make exact determination of the existence of any such facilities prior to submitting a bid. It is understood that the Contractor will be responsible for making the exact determination of the location and condition of these facilities.
- C. The location of all utilities indicated on the plans is taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown may be present.
- D. Sleeves, Insets, 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.
- E. Coordination:
 - 1. 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.

2. Cooperate with other trades in furnishing material and information for sleeves, bucks, chases, mountings, backing, foundations and wiring required for installation of mechanical items.
 3. 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.
- F. 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.

3.4 TEMPORARY FACILITIES AND CONTROLS

- A. Comply with Division 01 requirements.
- B. Permanent mechanical systems' equipment utilized for temporary facilities shall be started with all controls and safeties installed and operational. Start-up shall be done by a factory approved mechanic only.
- C. Agency'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.

3.5 CLOSEOUT

- A. General: Refer to the Division 01 sections for general closeout requirements. Calibrate all equipment requiring same.
- B. Record Drawings: Submit record set of drawings required in Division 01, Submittals and as previously specified in this Section.
- C. 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 Engineer present, and with the Agency'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 strainers, excessively worn parts and similar expendable items of the work.
- D. Operation and Instruction: Provide up to eight (8) hours of on-site training to Agency's personnel on all mechanical systems and equipment. Training shall include maintenance, lubrication, troubleshooting and repair. Contractor shall provide necessary written manuals and training aides explaining operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety and similar features of the installed system.

Three (3) copies of written manuals shall be left with Agency at end of training.

END OF SECTION 023000

SECTION 260000 - ELECTRICAL PROVISIONS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS: All work covered under these provisions is to be “design/build” by contractor utilizing specific equipment and materials as may be specified elsewhere in project Drawings or Specifications. Division 01 requirements apply for the work specified in this Section.

1.2 SCOPE OF WORK: The work covered by this Specification shall include designing, drawing, and furnishing all labor, materials, equipment and services to construct and install the complete electrical system as shown on the Drawings and specified herein. Contractor is responsible for obtaining any and all permits required for work covered by this Specification. In addition to any other submittals as may be required in this Section and Related Sections, Contractor shall submit an electrical plan to Engineer for review. Verify all conditions on the job site and lay out work accordingly.

1.3 RELATED WORK:

- A. The General Provisions apply to this Division, including but not limited to:
 - 1. Drawings and Specifications.
 - 2. Contract Modifications, addendums and change orders.
- B. Section 400, General Conditions, applies to this Division.
- C. Related work provided in Divisions 02 through 10.
- D. Related Work provided in Division 22 and 23.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. All work, installations, materials and equipment shall comply with the provision of the following codes, referenced standards, and regulations, except where more stringent requirements are shown or specified:
 - a. Oregon Plumbing Specialty Code.
 - b. Oregon Mechanical Specialty Code.
 - c. Oregon Structural Specialty Code.
 - d. Oregon Electrical Specialty Code.
 - e. Oregon Fire Code
 - f. All City, County, State and Federal applicable laws and regulations.
 - g. Regulations and standards set forth by ASME, ASHRAE, SMACNA, AGA and ARI.
 - 2. Should there be any direct conflict between Codes and the Drawings and

- Specifications, the Codes' rules and regulations shall govern.
3. Where two or more codes or regulations apply, the more stringent of the two shall be exercised.
 4. Should the Documents indicate a condition, which will conflict with the Codes, the Contractor shall inform the Agency's Representative and refrain from installing that portion until resolved. Any work installed in violation of the Codes will be removed and correctly installed as part of the Contract work.
 5. If the Drawings and Specifications indicate a higher quality than code, the Drawings and Specifications shall govern.
 6. Electrical products shall bear the U.L. label.
- B. The entire electrical system shall operate correctly at full capacity without objectionable noise, vibration or decrease of efficiency.
- C. Materials and Equipment:
1. Equipment furnished shall meet all requirements of the Drawings and Specifications and be suitable for the installation. Equipment not meeting all requirements will not be acceptable.
 2. Where two or more units of the same class of equipment are furnished, use products of the same manufacturer.
 3. Furnish all materials and equipment, new and of size, type and quality herein specified.
- D. Workmanship:
1. Follow manufacturers' instructions. If they are in conflict with the Drawings and Specifications, obtain clarification from the Engineer prior to beginning the work.
- E. Cutting and Patching:
1. Provide for cutting, patching and repairing for the installation of the work specified, including masonry work, concrete work, carpentry work and painting. Work shall be performed by skilled craftsmen of the respective trade.

1.5 PROJECT CONDITIONS:

- A. The locations of all utilities, wires, conduits, pipes, duct, 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.
- B. Prior to bid, contact the local utility companies to verify requirements. Provide all material and labor by utilities.
- C. The Contractor, before submitting a Bid on the work, must visit the site to become familiar with all visible existing conditions. As a result of having visited the premises, the Contractor shall be responsible for the installation of the work

as it relates to such visible existing conditions. The submission of the bid will be considered an acknowledgement of the part of the Bidder of visitation to the site.

- D. The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.
- E. Coordinate exact requirements governed by actual job conditions. Check all information and report all discrepancies before fabrication work. Report changes in the time to avoid unnecessary work. Make changes as directed by Agency's Representative.

1.6 SUBSTITUTION AND PRODUCT OPTIONS:

- A. See Division 01.
- B. The use of manufacturer's names, models and numbers in the Drawings and Specifications is intended to establish style, quality, appearance and usefulness. The model numbers listed are the last available to the designer, if no longer current, substitute equipment equal to or better than that represented by the model number listed. Items noted "or equivalent" will require prior acceptance.
- C. Submit for the Agency's Representative's review, manufacturer's detailed specifications and data sheets for all proposed substitutions. Submittals shall consist of a single sheet, or specific data need for consideration of approval. All pertinent data listed in the Specifications and on the Drawings shall be furnished, including all special features. See that all submittals are in proper order, and that all equipment will fit the space provided.
- D. All requests for approval of substitutions for materials other than those specified must be submitted in accordance with Instruction to Bidder.
- E. All changes required due to product substitutions are the responsibility of the Contractor.

1.7 PROJECT RECORD DRAWINGS:

- A. Obtain drawings from Engineer.
- B. Keep Drawings clean, undamaged and up to date.
- C. Record and accurately indicate the following:
 - 1. Depths, sizes and locations of all buried and concealed wires and conduits.
 - 2. Locations of all equipment.
 - 3. Changes, additions and revisions due to contract modifications.

- D. Drawings to be available for Engineer review.
- E. Submit as a part of Project Closeout Documents

1.8 CONTRACT MODIFICATIONS:

- A. In addition to the requirements of the General provisions, all supplemental cost proposals for this Division of work shall be accompanied by a complete itemized breakdown of labor and materials for each item. No exceptions will be made. Contract's estimating sheets for supplemental cost proposals shall be made available upon request. Labor must be separated and allocated to each item of work. Changes or additions subject to additional compensation made without written authorization based on agreed price shall be at Contractor's own risk and expense.

1.9 STORAGE AND HANDLING

- A. Delivery: Deliver to project site with manufacturer's labels intact and legible.
- B. Handling: Avoid damage.
- C. Storage: Store material inside, protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

1.10 WARRANTY:

- A. Provide a written guaranty covering the work of this Division for a period of one calendar year form the data of acceptance of the entire project as required by the General Provisions.
- B. Provide manufacturer's written warranties for material and equipment furnished under this Division insuring parts and labor for a period of one year from the date of acceptance of the entire project.
- C. Correct warranty items promptly upon notification.

1.11 OPERATIONS AND MAINTENANCE DATA:

- A. Prior to final inspection, provide three (3) copies of manufacturer's maintenance manuals for each piece of equipment or items requiring service. Manual shall include manufacturer's operation and maintenance instruction manuals and parts list for each piece of equipment or item requiring servicing. Include in the manual manufacturer's service data, wiring diagrams and parts lists for all major items of equipment, valve charts, balancing data and any additional equipment added by contract modification. Comply with provisions of Section 01 7800 where applicable.

- B. Submit bound in 8-1/2 x 11 inch text pages, three ring binders with durable plastic covers.
- C. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titling clearly printed under reinforced laminated plastic table.

1.13 SUBMITTALS:

- A. Design Drawings: Indicate the general layout of the equipment and wiring, suitable for submission for a plan review by the authority having jurisdiction.
- B. Product Data:
 - 1. Submit for review manufacturer's detailed shop drawings, specifications and stat sheets for all equipment to be furnished, as well as any wiring diagram showing field installed wiring and devices. Arrangement of electrical fixtures has been based on items of specific manufacturer intended as diagrammatic only.
 - 2. Indicate construction, capacities, accessories, etc. Manufacturer's abbreviations or codes are not acceptable.
 - 3. List the name of the motor manufacturer for each piece of equipment.
- C. Submission Requirements:
 - 1. Shop Drawings and Product Data:
 - a. Refer to Division 01
 - 2. Sample: Submit any samples required at the same time that shop drawings and product data are submitted.
- D. It shall be the Contractor's responsibility to:
 - 1. See that all submittals are in proper order.
 - 2. Ensure that all equipment will fit in the space provided.
 - 3. Assure that all deviation from Drawings and Specification are specifically noted and called to the attention of the Engineer/Contracting Officer in the submittals. Failure to comply will void approval automatically.
 - 4. Deviation, discrepancies, and conflicts between the submittals and the contract documents discovered prior to or after the review process shall not relieve the Contractor of this responsibility to comply with the contract documents.

1.14 START-UP:

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Agency's Representative seven days prior to start-up of each item.
- C. Verify that each piece of equipment of system has been checked prior to start-up for proper lubrication, drive rotation, belt tension, control sequence,

or other conditions, which may cause damage.

- D. Verify that tests, meter readings and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are completed and tested.
- F. Execute start-up under supervision of responsible manufacturer's representative or Contractor's personnel in accordance with manufacturer's instructions.

1.15 FEES, PERMITS AND INSPECTIONS: The Contractor is responsible to apply for and obtain all necessary permits, fees and inspections required by any public authority having jurisdiction. Refer to General Conditions for additional information.

1.16 DEFINITIONS

- A. "Furnish: Means to supply and deliver to the project site, ready for unloading, unpacking, assembly, installation and similar operations.
- B. "Install": Describes operations at project site including actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.
- C. "Provide": Means to furnish and Install, complete and ready for intended use.

PART 2 PRODUCTS

2.1 MATERIAL

- A. All materials and products used for construction shall be new, of the best grade, and latest products as listed in printed catalog data. All articles of a kind shall be the standard product of a single manufacturer. Trade names and manufacturers names denote a character and quality of equipment desired and shall not be construed as limiting competition.
- B. Asbestos: Do not use products made of or containing asbestos.

2.2 QUALITY ASSURANCE

- A. Refer to Division 01 Material and Equipment for information regarding available alternatives to materials and equipment specified herein. Product listings are for informational purposes only and establish a general standard of quality.
- B. Provide products which are compatible with other portions of the work and provide products with the proper and correct power and fuel burner characteristics and similar adaptations for the project.

2.3 BASIC FUNCTION

- A. Provide electrical system capable of supplying power needs for building's mechanical and plumbing systems.
- B. Provide means of artificial lighting in each room as directed by Agency and in accordance with all applicable codes, standards, and regulations.

2.4 EMERGENCY POWER BACKUP SYSTEM

- A. Provide Emergency Power Backup Electrical System capable of supplying emergency power needs for building systems, as indicated in Drawings and as directed by Owner.
- B. Provide means of artificial lighting with emergency power as indicated in Drawings.
- C. Emergency Power Backup Electrical System Basis of Design: Basis of design shall include all products and accessories to assemble and install a complete 8kW Power with 28.8kWh effective energy storage SystemEdge Radian emergency power system as manufactured by Outback Power - Alpha Technologies Services, Inc.
- D. Basis of design system sizing shall be verified by Contractor prior to start of construction.

2.5 OPERATION AND MAINTENANCE

- A. Maintenance Access
 - 1. All equipment shall be located to maintain ease of access.
 - 2. Equipment utilities shall be routed to allow for access to equipment and replacement without removal of utilities.
 - 3. Equipment shall be located in area which will allow for complete removal and replacement without demolition to building infrastructure.
 - 4. Provide access doors for access to all enclosed equipment.

PART 3 EXECUTION

3.1 INSPECTION:

- A. All work and materials are subject to field observation at any and all times by the Agency's Representative.
- B. The Contractor shall notify the Agency's Representative a minimum of two days prior to testing any piping system which must be witnessed and accepted before it is covered up or enclosed.
- C. Cover or otherwise suitably protect equipment and materials stored on the job site.

3.2 CLEANING

- A. General: Clean electrical equipment, fixtures, piping of stampings and markings (except those required by codes), iron cuttings, and other refuse.
- B. Painted Surfaces: Clean scratched or marred painted surfaces of rust or other foreign mater and paint with matching color industrial enamel, except as otherwise noted.
- C. Before operating any equipment or systems, make thorough check to determine that systems have been flushed and cleaned as required and equipment has been properly installed, lubricated and serviced. Check factory instructions to see that installations have been made accordingly and that recommended lubricants have been used.
- D. Use particular care in lubricating bearings to avoid damage by over-lubrication and blowing out seals. Check equipment for damage that may have occurred during shipment, after delivery or during installation. Repair damaged equipment as approved or replace with new equipment.

3.3 LAYOUT AND COORDINATION

- A. Site Examination: Before starting work, carefully examine site and all contract Drawings so as to 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.
- B. The existence of any wires, conduits, pipes, ducts or other service facilities are not necessarily shown. It will be the duty of the Contractor to visit the site and make exact determination of the existence of any such facilities prior to submitting a bid. It is understood that the Contractor will be responsible for making the exact determination of the location and condition of these facilities.
- C. The location of all utilities indicated on the plans is taken from existing public records. The exact location and elevation of all public utilities must be determined by the Contractor. It shall be the duty of the Contractor to ascertain whether any additional facilities other than those shown may be present.
- D. Sleeves, Insets, 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.
- E. Coordination:
 - 1. 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.
 - 2. Cooperate with other trades in furnishing material and information for sleeves, bucks, chases, mountings, backing, foundations and wiring

required for installation of electrical items.

3. Coordinate all work with other trades and determine in advance where interfacing of the electrical 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.
- F. 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.

3.4 TEMPORARY FACILITIES AND CONTROLS

- A. Comply with Division 01 requirements.
- B. Permanent electrical systems' equipment utilized for temporary facilities shall be started with all controls and safeties installed and operational. Start-up shall be done by a factory approved mechanic only.
- E. Agency'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.
- F. Maintain electric service to areas which are to remain in service during construction.

3.5 CLOSEOUT

- A. General: Refer to the Division 01 sections for general closeout requirements. Calibrate all equipment requiring same.
- B. Record Drawings: Submit record set of drawings required in Division 01, Submittals and as previously specified in this Section.
- C. 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 Engineer present, and with the Agency'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 strainers, excessively worn parts and similar expendable items of the work.
- D. Operation and Instruction: Provide up to eight (8) hours of on-site training to Agency's personnel on all electrical systems and equipment. Training shall include maintenance, lubrication, troubleshooting and repair. Contractor shall provide necessary written manuals and training aides explaining operational

diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety and similar features of the installed system. Three (3) copies of written manuals shall be left with Agency at end of training.

END OF SECTION 026000

SECTION 265000 - LIGHTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Luminaires and lampholders.
 2. Ballasts.
 3. Lamps.
 4. Emergency lighting equipment.

1.2 SUBMITTALS

- A. Submit for:
1. Luminaires: Include electrical ratings, dimensions, mounting, material, required clearances, terminations, wiring and connection diagrams, photometric data, diffusers, and louvers.
 2. Ballasts.
 3. Lamps.
 4. Emergency lighting equipment.
- B. Provide the following operating and maintenance instructions from the manufacturer for project closeout, see Project Closeout Requirements in Division 1:
1. Luminaires.
 2. Ballasts.
 3. Lamps.
 4. Emergency lighting equipment.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements:
1. Provide luminaires acceptable to code authority for application and location as indicated.
 2. Comply with applicable ANSI standards pertaining to lamp materials, lamp ballasts and transformers, and luminaires.
 3. Comply with applicable NEMA standards pertaining to lighting equipment.
 4. Provide luminaires and lampholders which comply with UL standards and have been UL listed and labeled for location and use indicated.
 5. Comply with NEC 410 as applicable to installation and construction of luminaires.
 6. Comply with fallout and retention requirements of UBC 52 for diffusers, baffles, louvers, and the like.

1.4 WARRANTY

- A. Ballast Manufacturer's Warranty: Not less than 2 years for magnetic type ballasts and 5 years for electronic type ballasts, based on date of manufacturer embossed on ballast, current with installation date. Warranty includes normal cost of labor for replacement of ballast.
- B. LED Luminaire Warranty: The manufacturer shall provide a warranty against loss of performance and defects in materials and workmanship for the

Luminaires for a period of 5 years after acceptance of the Luminaires. Replacement Luminaires shall be provided promptly after receipt of Luminaires that have failed at no cost to the customer. All warranty documentation shall be provided to customer prior to random sample testing.

- C. Lamp Warranty: 5 years LED module, 30 days for incandescent, 6 months for compact fluorescent, 12 for fluorescent and HID lamps.

1.5 MAINTENANCE

- A. Furnish 2 percent extra lens or louvers for each size and type of fluorescent luminaire.
- B. Furnish 10 percent extra lamps for each size and type installed.
- C. Furnish 5 percent extra ballasts for each size and type.

PART 2 PRODUCTS

2.1 LUMINAIRES

- A. Luminaires: Refer to description and manufacturers in Luminaire schedule.
- B. Where recessed luminaires are installed in cavities intended to be insulated, provide IC rated luminaires or other code approved installation.
- C. Luminaires installed under canopies, roof or open porches and similar damp or wet locations, UL labeled as suitable for damp or wet locations.
- D. Recessed Luminaires: Frame compatible with ceiling material installed at particular luminaire location. Provide proper trim, frame and modify luminaire to fit location and ceiling material.
- E. Finishes:
 - 1. Manufacturer's standard finish (unless otherwise indicated) over a corrosion resistant primer.
 - 2. Interior Light Reflecting Finishes: White or specular finish with not less than 85 percent reflectances.
 - 3. Exterior Finishes: As detailed in luminaire schedule or on Drawings. Refer cases of uncertain applicability to Architect for resolution prior to release for fabrication.
- F. Light Transmitting Components:
 - 1. Plastic diffusers, molded or extruded of 100 percent virgin acrylic.
 - 2. Prismatic acrylic, extruded, flat diffusers, 0.125-inch overall thickness, unless otherwise noted.
- G. Fluorescent Luminaires:
 - 1. Provide all open lamp fluorescent luminaires without diffusers or guards with turret type, spring loaded sockets.
 - 2. To facilitate multilevel lamp switching, wire lamps within luminaire with outermost lamp at

- both sides of luminaire on the same ballast, the next inward pair on another ballast and so on to innermost lamp (or pair of lamps).
3. Provide wire lamp guards on all exposed lamp fluorescent luminaires.

H. LED Luminaires:

1. Each luminaire shall consist of an assembly that utilizes LEDs as the light source. In addition, a complete luminaire shall consist of a housing, LED array, and electronic driver (power supply).
2. Each luminaire shall be rated for a minimum operational life of 50,000 hours as defined by IES LM-80 and TM-21.
3. Each luminaire shall be designed to operate at an average operating temperature of 25°C.
 - a. The operating temperature range shall be -40°C to +40°C.
 - b. Some parameters and tests (such as IESNA standard LM-80-08) shall be conducted at different ambient temperatures.
4. Each luminaire shall meet all parameters of this specification throughout the minimum operational life when operated at the average operating temperature.
5. The individual LEDs shall be connected such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire.
6. Each luminaire shall be listed with a nationally recognized testing laboratory (including but not limited to UL, CSA, ETL) under UL 1598 and UL 8750, or an equivalent standard from a recognized testing laboratory.

2.2 BALLASTS

A. Ballasts, General:

1. Provide ballasts rated for specified lamps, i.e., T-8 or T-5 rated ballasts where T-8 or T-5 lamps specified.
2. Thermal Protection: Internal UL Class P with automatic reset.
3. Power Factors: Not less than 90 percent unless otherwise indicated.
4. Sound Ratings: Rating A, except where not available as standard products from any manufacturer. Provide quietest ratings available.
5. Input Voltage: Match branch circuit supply voltage; refer to Drawings.
6. Provide number of ballasts in luminaires to provide multilevel switching as indicated on Drawings.

B. Fluorescent Electronic Ballasts:

1. Provide ballasts which meet requirements of UL 935 and bear the appropriate UL label.
2. Electrical Characteristics:
 - a. Provide electronic ballasts which withstand input power line transients as defined in ANSI C62.41, Category-A and IEEE 587. Ballasts tolerate a line voltage variation of plus or minus 10 percent.
 - b. Power Factor: 95 percent or higher.

- c. Lamp Crest Factor: 1.7 or less for rapid start ballasts and 1.85 or less for instant start ballasts.
 - d. Total Harmonic Distortion: Not to exceed 20 percent of the input current.
 - e. Comply with FCC rules and regulations Part 18, Class A concerning generation of both electromagnetic interference and radio frequency interference.
 - f. Provide relative light output equal to electromagnetic ballasts in a 2-light lensed luminaire using energy saving ballasts and energy saving lamps. Average ballast factor (BF) is a minimum of 0.88.
3. Performance Characteristics:
 - a. Input Wattage: Not to exceed 85 percent of the value for their energy efficient core and coil counterparts.
 - b. Start and operate lamps at 50F and energy savings lamps at 60F. Ballast case temperature is 25C rise above a 40C ambient.
 - c. Provide constant light output throughout minimum input voltage variations of plus or minus 20 percent from nominal 120 volt or 277 volt.
 4. Manufacturer: Advance RCN/VCN Series, Motorola, Magnetek, Universal, or approved.
- C. HID Ballasts:
1. Provide minus 20F minimum starting temperature.
 2. Constant wattage multitap autotransformer (CWA) types equal to Advance 73B Series except, high leakage-reactance high power factor (HX-HPF) equal to Advance 72C Series acceptable for up to 100 watt high pressure sodium lamp.
 3. Provide ballasts for luminaires installed indoors, and where otherwise indicated, encapsulated core and coil type or otherwise specifically designed by manufacturer for quiet operation.

2.3 LAMPS

- A. Provide lamps for all luminaires.
- B. HID Lamps:
 1. Where lamps are used in open luminaires, equip mercury vapor and metal halide luminaires with an integral approved shield or self-extinguishing lamps.
 2. Lamps, coated or clear as recommended by luminaire manufacturer to provide for maximum luminaire efficiency in luminaire used. Provide color improved mercury or metal halide lamps for indoor areas.
 3. For interior use, all metal halide lamps installed in a common area of building are of the same manufacturer's production run. Color discontinuities after initial "burn in" are unacceptable.
 4. HID lamp types as specified in luminaire schedule. General Electric, Osram/Sylvania, Philips, Venture.
- C. Fluorescent Lamps:
 1. Unless otherwise noted, 3500K minimum CRI 80, length and wattage as noted in luminaire schedule. General Electric, Osram/Sylvania, Philips.

2. Compact Fluorescent Lamps: Quad Tube, 3500K unless otherwise noted.
General Electric, Osram/Sylvania, Philips.
3. Provide fluorescent lamps by same manufacturer General Electric, Osram/Sylvania, Philips.

D. LED

1. Light Output
 - a. The minimum initial lumen output of the luminaire shall be 3294 lumens exiting the luminaire in the 0-90 degree zone as measured by the IESNA Standard LM-79-08.
 - b. The Lumen output shall not decrease by more than 20% over the minimum operational life of the section 2.2 (or L80 shall be at least the minimum number of hours as specified in second 2.2)
 - c. The Measurements shall be calibrated to standard photopic calibrations.
2. Light Color/Quality.
 - a. Corrected Color temperature (CCT) range between 3,500K and 4,100K shall be correlated to chromaticity as defined by the absolute (X,Y) coordinates on the 2-D CIE chromaticity chart.
 - b. The color rendition index (CRI) shall be 80 or greater

2.4 EMERGENCY LAMP POWER SUPPLY

- A. Manufacturers: Bodine, Iota, Lithonia.
- B. Description: Self-contained battery-operated power supply for operating LED, one T8 or one compact fluorescent lamp for a minimum output of 90 minutes.
- C. Provide access hatches, for emergency battery backup ballasts, adjacent to recessed 6-inch or less diameter downlights installed in inaccessible ceilings.

PART 3 EXECUTION

3.1 COORDINATION

- A. Verification of Conditions: Verify ceiling construction, recessing depth and other construction details prior to release of luminaire for shipment. Refer cases of uncertain applicability to Engineer for resolution prior to release of luminaires for shipment.
- B. Provide all lighting indicated on Drawings with a luminaire of the type designated and appropriate for location. Where outlet symbols appear on Drawings without a type designation provide a luminaire the same as those used in similar or like locations.

3.2 INSTALLATION

- A. Install luminaire of types indicated where shown and at indicated heights; in accordance with manufacturer's written instructions and with recognized industry practices; to ensure that luminaires comply with requirements and serve intended purposes.
- B. Align, mount and level luminaires uniformly. Use ball hangers for suspended stem mounted luminaires.

- C. Avoid interference with and provide clearance for equipment. Where indicated locations for luminaires conflict with locations for equipment, change locations for luminaire by minimum distance necessary as directed by Engineer.
- D. Suspended Luminaires: Mounting heights indicate clearances between bottom of luminaire and finished floors.
- E. Interior Luminaire Supports:
 - 1. Support Luminaires: Anchor supports to structural slab or to structural members within a partition, or above a suspended ceiling.
 - 2. Maintain luminaire positions after cleaning and relamping.
 - 3. Support luminaires without causing ceiling or partition to deflect.
- F. Wiring:
 - 1. Recessed luminaires to be installed using flexible metallic conduit with luminaire conductors to branch circuit conductors in a nearby accessible junction box over ceiling. Junction box fastened to a building structural member within 6-feet of luminaire.
 - 2. Install luminaires for lift-out and removal from ceiling pattern without disconnecting conductors or defacing ceiling materials.
 - 3. Flexible connections where permitted to exposed luminaires; neat and straight, without excess slack, attached to support device.
 - 4. Install junction box, flexible conduit and high temperature insulated conductors for through wiring of recessed luminaires.
- G. Relamp luminaires which have failed lamps at completion of work.

3.3 ADJUSTING

- A. Focus and adjust floodlights, spotlights and other adjustable luminaires, with Engineer, at such time of day or night as required.
- B. Align luminaires that are not straight and parallel/perpendicular to structure.

3.4 CLEANING

- A. Clean paint splatters, dirt, dust, fingerprints, and debris from luminaires.
- B. Where finish of luminaires has been damaged, touch up finish as directed by manufacturer's instructions.

END OF SECTION 265000

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removing existing vegetation.
2. Clearing and grubbing.
3. Stripping and stockpiling topsoil.
4. Stripping and stockpiling rock.
5. Removing above- and below-grade site improvements.
6. Temporary erosion and sedimentation control.

1.2 DEFINITIONS

- A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil," but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil; the zone where plant roots grow.
- D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.3 MATERIAL OWNERSHIP

- A. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.4 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
1. Use sufficiently detailed photographs or video recordings.

- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.5 FIELD CONDITIONS

- A. Utility Locator Service: Notify utility locator service, Miss Utility Call Before You Dig/Dig Safe System/One Call/Insert name for area where Project is located before site clearing.
- B. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.
- C. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

PART 2 - PRODUCTS PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control best practices.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until project completion.
- D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.3 EXISTING UTILITIES

- A. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Engineer's written permission.

3.4 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of **8 inches**, and compact each layer to a density equal to adjacent original ground.

3.5 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth indicated on Drawings of 6 inches. Insert requirement in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects larger than **2 inches** in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.

3.6 STOCKPILING ROCK

- A. Stockpile rock away from edge of excavations without intermixing with other materials. Cover to prevent windblown debris from accumulating among rocks.

3.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preparing subgrades for slabs-on-grade, walks, pavements.
2. Excavating and backfilling for buildings and structures.
3. Drainage course for concrete slabs-on-grade.
4. Subbase course for concrete walks, pavements.
5. Subbase course and base course for asphalt paving.
6. Excavating and backfilling trenches for utilities and pits for buried utility structures.
7. Excavating and filling for rough grading the Site.

B. Related Requirements:

1. Section 311000 "Site Clearing" for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.

1.2 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices. See Geotechnical Report for additional information.
 2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, will be without additional compensation.
- G. Fill: Soil materials used to raise existing grades.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other fabricated stationary features constructed above or below the ground surface.
- I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
1. Geotextiles.
 2. Subbase and Base Material.
- B. Samples for Verification: For the following products, in sizes indicated below:
1. Geotextile: **12 by 12 inches**.
 2. Warning Tape: **12 inches** long; of each color.

1.4 FIELD CONDITIONS

- A. Utility Locator Service: Notify utility locator service, "Miss Utility" "Call Before You Dig" "Dig Safe System" "One Call" Insert name for area where Project is located before beginning earth-moving operations.

- B. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 311000 "Site Clearing" are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a **1-1/2-inch** sieve and not more than 12 percent passing a **No. 200** sieve free of foreign material and meeting the requirements of the current edition of the Oregon Standard Specifications for Construction, APWA and ODOT .
- B. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a **3/4-inch** sieve and not more than 5 percent passing a **No. 200** sieve free of foreign material and meeting the requirements of the current edition of the Oregon Standard Specifications for Construction, APWA and ODOT.

2.2 GEOTEXTILES

- A. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability:
 - a. Class 2; AASHTO M 288.
 - b. Apparent Opening Size: **No. 60** sieve, maximum; ASTM D4751.
 - c. Permittivity: 0.02 per second, minimum; ASTM D4491.
 - d. UV Stability: 50 percent after 500 hours' exposure; ASTM D4355.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.
- B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
- D. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

3.3 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.4 EXCAVATION FOR STRUCTURES

- A. 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.

1. 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.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus **1 inch**. Do not disturb bottom of excavations intended as bearing surfaces.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. 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 **6 inches** higher than top of pipe or conduit unless otherwise indicated.
 1. Clearance: As indicated.
- C. Trench Bottoms:
 1. Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade 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.
 - a. For pipes and conduit less than **6 inches** in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - b. For pipes and conduit **6 inches** or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
 - c. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
 - d. Excavate trenches **3 inches** deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
 2. Excavate trenches **3 inches** deeper than bottom of pipe and conduit

elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

- a. Excavate trenches **6 inches** deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.7 SUBGRADE INSPECTION

- A. Notify Engineer when excavations have reached required subgrade.
- B. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to **3 mph**.
 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.8 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of **2500 psi**, may be used when approved by Engineer.
 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Engineer.

3.9 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 2. Surveying locations of underground utilities for Record Documents.
 3. Testing and inspecting underground utilities.
 4. Removing concrete formwork.
 5. Removing trash and debris.
 6. Removing temporary shoring, bracing, and sheeting.
 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.11 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.
- B. 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.
- C. Backfill voids with satisfactory soil while removing shoring and bracing.
- D. Initial Backfill:
 1. Soil Backfill: Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of **6 inches** over the pipe or conduit.
 - a. 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.
- E. Final Backfill:
 1. Sub-base Backfill: Place and compact final backfill of subbase material to final subgrade elevation, as indicated in plans.
- F. Warning Tape: Install warning tape directly above utilities, **12 inches** below

finished grade, except **6 inches** below subgrade under pavements and slabs.

3.12 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry density.

3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than **3 inches** in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698:
 - 1. Under structures and building slabs recompact top **12 inches** of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 - 2. Under turf or unpaved areas, scarify and recompact top **6 inches** below subgrade and compact each layer of backfill or fill soil material at 85 percent.
 - 3. For utility trenches, compact each layer of initial and final backfill soil material as indicated in Drawings .

3.14 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated

finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
 2. Walks: Plus or minus 1 inch.
 3. Pavements: Plus or minus 1/2 inch.
- C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a **10-foot** straightedge.

3.15 SUBSURFACE DRAINAGE

- A. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Encase D3034 perforated pipe in 4" thickness of 3/4" open graded crushed rock and wrap in subsurface drainage geotextile.

3.16 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place base course under pavements and walks as follows:
1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 2. Place base course material over subbase course under hot-mix asphalt pavement.
 3. Shape subbase course and base course to required crown elevations and cross-slope grades.
 4. Place subbase course and base course **6 inches** or less in compacted thickness in a single layer.
 5. Place subbase course and 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.
 6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of relative maximum density as determined by AASHTO T-180 .

3.17 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 2. Determine that fill material classification and maximum lift thickness comply with requirements.

3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
 4. Special inspections , as indicated in Drawings.
- B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. 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.
- D. 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 Engineer.
- E. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2167, ASTM D2937, and ASTM D6938, as applicable. Tests will be performed at the following locations and frequencies:
1. 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.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.18 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.19 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Hot-mix asphalt paving.
- B. Related Requirements:
 - 1. Section 312000 "Earth Moving" for subgrade preparation, fill material, separation geotextiles, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
 - 2. Section 321313 "Concrete Paving" for concrete pavement and for separate concrete curbs, gutters, and driveway aprons.

1.2 UNIT PRICES

- A. Work of this Section is affected by Tons.

1.3 ACTION SUBMITTALS

- A. Product Data: Include technical data and tested physical and performance properties.
 - 1. Paving geotextile.
 - 2. Joint sealant.
- B. Hot-Mix Asphalt Designs:
 - 1. For each hot-mix asphalt design proposed for the Work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For paving-mix manufacturer, and, testing agency.
- B. Material Certificates: Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.
 - 1. Aggregates.
 - 2. Asphalt binder.
 - 3. Asphalt cement.

- 4. Tack coat.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Insert requirement.
 - 1. Not less than 5 years experience in the actual production of the specified products.
- B. Installer's Qualifications:
 - 1. Installer with not less than 5 years experience in installation of the specified products.
- C. Testing Agency Qualifications: Qualified in accordance with ASTM D3666 for testing indicated.
- D. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the current edition of the Oregon Standard Specifications for Construction for asphalt paving work.
 - 1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 - 1. Asphalt Base Course: Minimum surface temperature of **45 deg F** and rising at time of placement.
 - 2. Asphalt Surface Course: Minimum surface temperature of **45 deg F** and rising at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. General: Use materials and gradations that have performed satisfactorily in previous installations.
- B. Furnish the type(s) of HMAC shown or as directed. The broadband limits for

each of the mix types are specified in section 00745.12b of the current edition of the Oregon Standard Specifications for Construction unless otherwise specified.

1. The base course shall be 1/2" dense graded, Level 2 HMAC as defined in section 00745 of the current edition of the Oregon Standard Specifications for Construction unless otherwise specified.

2.2 ASPHALT MATERIALS

- A. Asphalt Cement: Use PG 64-22 or PG 64-28 per the current edition of the Oregon Standard Specifications for Construction. .
- B. Tack Coat: Type CSS-1 or CSS-1h emulsified asphalt (EA) conforming to the current edition of the Oregon Standard Specifications for Construction, APWA & ODOT.
- C. Water: Potable.

2.3 AUXILIARY MATERIALS

- A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires, asphalt shingles from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.
- B. Joint Sealant: ASTM D6690, Type II or III, hot-applied, single-component, polymer-modified bituminous sealant.

2.4 MIXES

- A. Hot-Mix Asphalt: Dense-graded, hot-laid, hot-mix asphalt plant mixes and complying with the following requirements:
 1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
 2. Base Course: The base course shall be 1/2" dense graded, Level 2 HMAC as defined in section 00744 of the current edition of the Oregon Standard Specifications for Construction unless otherwise specified.
 3. Surface Course: The surface course shall be 1/2" dense graded, Level 2 HMAC as defined in section 00744 of the current edition of the Oregon Standard Specifications for Construction unless otherwise specified..

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protection: Provide protective materials, procedures, and worker training to prevent asphalt materials from spilling, coating, or building up on curbs, driveway aprons, manholes, and other surfaces adjacent to the Work.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to **3 mph**.
 - 2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than **15 tons**.
 - 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

3.3 SURFACE PREPARATION

- A. Ensure that prepared subgrade has been proof-rolled and is ready to receive paving. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces.
- B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of **0.05 to 0.15 gal./sq. yd.**
 - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.4 HOT-MIX ASPHALT PLACEMENT

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
 2. Place hot-mix asphalt surface course in single lift.
 3. The temperature of the mixture at the time it is placed in final position shall be within 10 degrees of 280 degrees Fahrenheit. The Engineer may adjust the lay-down temperature in 10 degree increments to attain maximum workability and compaction. In no case shall the lay-down temperature of mixture be less than 240 degrees Fahrenheit.
 4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
 5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than **10 feet** wide unless infill edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Overlap mix placement about **1 to 1-1/2 inches** from strip to strip to ensure proper compaction of mix along longitudinal joints.
 2. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.
- D. Place asphalt wearing course within 24 hours of applying tack coat over base course.

3.5 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints.
 2. Offset longitudinal joints, in successive courses, a minimum of **6 inches**.
 3. Offset transverse joints, in successive courses, a minimum of **24 inches**.
 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Offset transverse joints, in successive courses, a minimum of 24 inches.
 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.6 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
 - 1. Complete compaction before mix temperature cools to **180 deg F**.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling Density Requirements:
 - 1. The Contractor is responsible for process control and shall conduct sampling, testing, measurement and inspection. The contractor shall provide daily nuclear density testing (ODOT Test Method 310C 87) to develop rolling patterns necessary to achieve the minimum compaction requirement of 90 percent as determined by Rice Density Test AASHTO T 209 as modified by ODOT TM 306. This is in addition to Owner's testing as necessary to ensure the finished pavement meets specifications.
 - 2. Asphalt compaction below 88 percent as determined by Rice Density Test AASHTO T 209 as modified by ODOT TM 306 is not acceptable.
 - 3. The Engineer will determine the suitability of the final product through final acceptance testing. Results of these tests will be used to determine payment deductions, if any to be assessed against the Contract. The final density of each paving project location will be determined by averaging the results of a minimum of five (5) density tests taken with a nuclear gauge (ODOT TM 310C-87) at randomly selected locations within each paving project.
 - 4. Paving in areas 6 feet wide or less and irregular areas not accessible by large rollers are not subject to the minimum compaction per (2) above.
 - 5. The Owner may take acceptance tests to verify that the work meets specifications.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.7 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus **1/2 inch**.
 - 2. Surface Course: Plus **1/4 inch**, no minus.
- B. Pavement Surface Smoothness: Compact each course to produce surface smoothness within the following tolerances as determined by using a **10-foot** straightedge applied transversely or longitudinally to paved areas:
 - 1. Surface Course: 1/4 inch.
 - 2. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is **1/4 inch**.
- C. Asphalt Traffic-Calming Devices: Compact and form asphalt to the shapes indicated and within a tolerance of plus or minus **1/8 inch** of height indicated above pavement surface.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined in accordance with ASTM D3549/D3549M.
- C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- D. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

END OF SECTION 321216

SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes concrete paving including the following:
 - 1. Driveways.
 - 2. Roadways.
 - 3. Parking lots.
 - 4. Curbs and gutters.
 - 5. Walks.

- B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for general building applications of concrete.
 - 2. Section 321723 "Pavement Markings."

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified ready-mix concrete manufacturer, and, testing agency.

- B. Material Certificates: For the following, from manufacturer:
 - 1. Cementitious materials.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Admixtures.
 - 4. Curing compounds.
 - 5. Applied finish materials.
 - 6. Bonding agent or epoxy adhesive.

- C. Material Test Reports: For each of the following:
 - 1. Aggregates:
- D. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").
- B. Testing Agency Qualifications: Qualified according to ASTM C1077 and ASTM E329 for testing indicated.
 - 1. Personnel conducting field tests must be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

1.6 FIELD CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:
 - 1. 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.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.
- C. Hot-Weather Concrete Placement: Comply with **ACI 301** and as follows when hot-weather conditions exist:
 - 1. 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

in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with **ACI 301** unless otherwise indicated.

2.2 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.
 1. Use flexible or uniformly curved forms for curves with a radius of **100 feet** or less. Do not use notched and bent forms.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, fabricated from as-drawn steel wire into flat sheets.
- C. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.
- D. Epoxy-Coated Welded-Wire Reinforcement: ASTM A884/A884M, Class A, plain steel.
- E. Reinforcing Bars: ASTM A615/A615M, **Grade 60**; deformed.
- F. Galvanized Reinforcing Bars: ASTM A767/A767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A615/A615M, **Grade 60** deformed bars.

- G. Epoxy-Coated Reinforcing Bars: ASTM A775/A775M or ASTM A934/A934M; with ASTM A615/A615M, **Grade 60** deformed bars.
- H. Steel Bar Mats: ASTM A184/A184M; with ASTM A615/A615M, **Grade 60** deformed bars; assembled with clips.
- I. Plain-Steel Wire: ASTM A1064/A1064M, as drawn.
- J. Deformed-Steel Wire: ASTM A1064/A1064M.
- K. Epoxy-Coated-Steel Wire: ASTM A884/A884M, Class A; coated, plain.
- L. Joint Dowel Bars: ASTM A615/A615M, **Grade 60** plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A767/A767M, Class I coating. Cut bars true to length with ends square and free of burrs.
- M. Epoxy-Coated, Joint Dowel Bars: ASTM A775/A775M; with ASTM A615/A615M, **Grade 60** plain-steel bars.

2.4 CONCRETE MATERIALS

- A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:
 - 1. Portland Cement: ASTM C150/C150M, gray portland cement Type I.
 - 2. Fly Ash: ASTM C618, Class C, or, Class F.
 - 3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C33/C33M, Class 4S, uniformly graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Air-Entraining Admixture: ASTM C260/C260M.
- D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

2.5 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry, or, cotton mats.
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-

polyethylene sheet.

- C. Water: Potable.

2.6 RELATED MATERIALS

- A. Joint Fillers: ASTM D1751, asphalt-saturated cellulosic fiber in preformed strips.

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to **ACI 301**, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed concrete design mixtures for the trial batch method.
- B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
 - 1. Fly Ash or Pozzolan: 25 percent.
 - 2. Slag Cement: 50 percent.
 - 3. Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 25 percent.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
 - 1. Air Content: 4-1/2 percent plus or minus 1.5 percent.
- D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
- E. Concrete Mixtures: Normal-weight concrete.
 - 1. Compressive Strength (28 Days): 4000 psi.
 - 2. Maximum W/C Ratio at Point of Placement: 0.45.
 - 3. Slump Limit: 5 inches, plus or minus **1 inch**.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and

concrete according to ASTM C94/C94M and ASTM C1116/C1116M. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between **85 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

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.
- B. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.
 1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to **3 mph**.
 2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than **15 tons**.
 3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 312000 "Earth Moving."
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 INSTALLATION OF STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

- A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
 - 1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.
- B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.
 - 1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
 - 2. Provide tie bars at sides of paving strips where indicated.
 - 3. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
- D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
 - 1. 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 grooving-tool marks on concrete surfaces.

- a. Tolerance: Ensure that grooved joints are within 3 inches either way from centers of dowels.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut **1/8-inch-** wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
 - a. Tolerance: Ensure that sawed joints are within 3 inches either way from centers of dowels.
 3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.
- E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.
- B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. 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.
- D. Comply with **ACI 301** requirements for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.
- F. 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.
- G. Consolidate concrete according to **ACI 301** by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
 1. 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, and joint devices.

- H. Screed paving surface with a straightedge and strike off.
- I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.
- K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.
 - 1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
 - 2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
 - 3. 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.

3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching **0.2 lb/sq. ft. x h** before and

during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or, a combination of these:

3.9 PAVING TOLERANCES

- A. Comply with tolerances in **ACI 117** and as follows:
 - 1. Elevation: **1/2 inch**.
 - 2. Thickness: Plus **3/8 inch**, minus **1/4 inch**.
 - 3. Surface: Gap below **10-feet-** long; unlevelled straightedge not to exceed **1/2 inch**.
 - 4. Joint Spacing: **3 inches**.
 - 5. Contraction Joint Depth: Plus **1/4 inch**, no minus.
 - 6. Joint Width: Plus **1/8 inch**, no minus.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172/C172M will be performed according to the following requirements:
 - 1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C231/C231M, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air

temperature is **40 deg F** and below and when it is **80 deg F** and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C39/C39M; test one specimen at seven days and two specimens at 28 days.
 - a. A compressive-strength test to be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.
- C. Strength of each concrete mixture will be satisfactory if average of any three 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**.
- D. Test results to be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests to 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.
- E. Additional Tests: Testing and inspecting agency will 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 Engineer.
- F. Concrete paving will be considered defective if it does not pass tests and inspections.
- G. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- H. Prepare test and inspection reports.

3.11 REPAIR AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Engineer.
- B. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- C. Maintain concrete paving free of stains, discoloration, dirt, and other foreign

material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 321723 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Painted markings applied to asphalt paving.
 2. Painted markings applied to concrete surfaces.

1.2 ACTION SUBMITTALS

- A. Product Data: Include technical data and tested physical and performance properties.
1. Pavement-marking paint, alkyd.

1.3 FIELD CONDITIONS

- A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for alkyd materials, and not exceeding **95 deg F**.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design", the ABA standards of the Federal agency having jurisdiction and ICC A117.1 Insert requirement.

2.2 PAVEMENT-MARKING PAINT

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Aexcel Corporation
 2. Columbia Paint & Coatings, Inc.; a subsidiary of Sherwin-Williams Company (The)
 3. Farrell-Calhoun

4. Kelly-Moore Paints
 5. Sherwin-Williams Company (The)
 6. The Dow Chemical Company
 7. Transpo Industries, Inc.
- B. Source Limitations: Obtain pavement-marking paints from single source from single manufacturer.
- C. Pavement-Marking Paint, Alkyd: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, Type N; colors complying with FS TT-P-1952F.
1. Color: As indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that pavement-marking substrate is dry and in suitable condition to begin pavement marking in accordance with manufacturer's written instructions.
- B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 PAVEMENT MARKING

- A. Sweep and clean surface to eliminate loose material and dust.
- B. 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.
 1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to asphalt paving or concrete surface. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath stencil.
 2. Broadcast glass beads uniformly into wet markings at a rate of **6 lb/gal.**

3.3 PROTECTING AND CLEANING

- A. Protect pavement markings from damage and wear during remainder of construction period.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 321723

SECTION 331415 - SITE WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Water-distribution piping and related components outside the building for domestic water service, and terminated 5 ft. from building. Terminate water-service piping with appropriate fitting for extension by Division 22.

B. Related Requirements:

1.2 DEFINITIONS

1.3 ACTION SUBMITTALS

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

B. Shop Drawings:

1. Detail precast concrete vault assemblies and indicate dimensions, method of field assembly, and components.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Preparation for Transport: Prepare piping, valves, meters, backflow prevention devices, and fire hydrants according to the following:

1. Ensure that piping, valves, meters, backflow prevention devices, and fire hydrants are dry and internally protected against rust and corrosion.
2. Protect threaded ends and flange faces against damage.
3. Set piping, valves, meters, backflow prevention devices, and fire hydrants in best position for handling and to prevent rattling.

B. During Storage: Use precautions for piping, valves, meters, backflow prevention devices, and fire hydrants according to the following:

1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
2. Protect from weather. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.

- C. Handling: Use sling to handle products if size requires handling by crane or lift. Rig products to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.
- D. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- E. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- F. Protect flanges, fittings, and specialties from moisture and dirt.
- G. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.5 COORDINATION

- A. Coordinate connection to water main with utility company.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of utility company supplying water. Include backflow prevention.
- B. Comply with standards of authorities having jurisdiction for domestic water-service piping, including materials, installation, testing, and disinfection.
- C. Piping materials to bear label, stamp, or other markings of specified testing agency.
- D. Comply with ASTM F645 for selection, design, and installation of thermoplastic water piping.
- E. All piping and appurtenances intended to convey or dispense water for human consumption are to comply with the U.S. Safe Drinking Water Act (SDWA), with requirements of the Authority Having Jurisdiction (AHJ), and with NSF 61/NSF 372 or are certified in compliance with NSF 61/NSF 372 by an ANSI-accredited third-party certification body, that the weighted average lead content at wetted surfaces is less than or equal to 0.25 percent.

2.2 PIPING MATERIALS

- A. Comply with requirements in "Piping Applications" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and service sizes.
- B. Potable-water piping and components comply with NSF 14, NSF 61, and NSF 372.

2.3 PVC PIPE AND FITTINGS

- A. Polyethylene Tubing:
 - 1. HDPE service tubing shall be copper tube size (CTS) and rated at 200 psi.

2.4 PIPING JOINING MATERIALS

- A. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.
- B. Brass:
 - 1. Mueller Co. Brass Fittings or approved equal as shown on plans.
 - 2. Mueller Co. Brass Fittings or approved equal as shown on plans.

2.5 DETECTOR CHECK VALVES

- A. Source Limitations: Obtain detector check valves from single manufacturer.
- B. Description: Products shall be as detailed on plans.

2.6 METER VALVES

2.7 WATER METERS

- A. Water Meter - Utility Company Furnished:
 - 1. Utility Company: <Mueller >.
- B. Water Meter:
 - 1. Owner provided:

2.8 WATER METER BOXES

A. Water Meter Boxes:

1. Water Meter Boxes: Products shall be as detailed on plans.

2.9 CONCRETE VAULTS

- ### A. Concrete Vault - Precast, Reinforced Concrete: Products shall be as detailed on plans..

PART 3 - EXECUTION

3.1 EARTHWORK

- #### A. Comply with excavating, trenching, and backfilling requirements in Section 312000 "Earth Moving."

3.2 PIPING APPLICATIONS

- #### A. Transition couplings and special fittings with pressure ratings at least equal to piping pressure rating may be used unless otherwise indicated.
- #### B. Do not use flanges or unions for underground piping.
- #### C. Flanges, unions, grooved-end-pipe couplings, and special fittings may be used, instead of joints indicated, on aboveground piping and piping in vaults.
- #### D. Underground water-service piping 3" and smaller to be any of the following:
1. HDPE, Copper Tube Size, and rated at 200 psi with City standard Mueller brass fittings or equivalent.
- #### E. Water Meter Box Water-Service Piping: 3/4" to 2" to be same as underground water-service piping.
- #### F. Aboveground and vault water-service piping 3" and smaller to be the following:
1. PVC, Schedule 80 pipe; PVC, Schedule 80 socket fittings; and solvent-cemented joints.

3.3 VALVE APPLICATIONS

- #### A. Drawings indicate valve types to be used. Where not specified, the following

standards apply:

1. AWWA Standards (current edition)
2. NFPA Standards (current edition)
3. Oregon Standard Specifications for Construction, APWA & ODOT

3.4 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Comply with Section 330500 "Common Work Results for Utilities" for piping-system common requirements.

3.5 INSTALLATION OF PIPING

- A. Install PVC, AWWA pipe in accordance with ASTM F645 and AWWA M23.
- B. Bury piping with depth of cover over top at least 30 inches, with top at least 12 inches below level of maximum frost penetration, and according to the following:
 1. Under Driveways: With at least 36 inches of cover over top.
- C. Extend water-service piping and connect to water-supply source and building water-piping systems at outside face of building wall in locations and pipe sizes indicated.
 1. Terminate water-service piping at building wall until building water-piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building water-piping systems when those systems are installed.

3.6 JOINT CONSTRUCTION

- A. Comply with Section 330500 "Common Work Results for Utilities" for basic piping joint construction.
- B. Make pipe joints according to the following:
 1. PVC Piping Gasketed Joints: Use joining materials in accordance with AWWA C900. Construct joints with elastomeric seals and lubricant in accordance with ASTM D2774 or ASTM D3139 and pipe manufacturer's written instructions.

3.7 INSTALLATION OF WATER METER BOXES

- A. Install water meter boxes in paved areas flush with surface.

3.8 INSTALLATION OF CONCRETE VAULTS

- A. Install precast concrete vaults in accordance with ASTM C891.

3.9 CONNECTIONS

- A. See Section 330500 "Common Work Results for Utilities" for piping connections to valves and equipment.
- B. Connect water-distribution piping to interior domestic water piping.

3.10 FIELD QUALITY CONTROL

- A. Field Tests:
 - 1. Disinfection Tests.
- B. Field Inspections: Notify Engineer prior to work of this section.
- C. Special Inspections for Code Compliance:
 - 1. Test Hydrostatically. All testing, acceptance, and documentation shall comply with the current Oregon State Plumbing Specialty Code and NFPA and AWWA specifications as applicable.
 - 2. Prior to testing partially backfill or provide other means of restraint to prevent any movement during the test.
 - 3. Observance: Engineer to observe domestic testing. Contractor shall notify Engineer at least 48 hours prior to testing.

3.11 IDENTIFICATION

- A. Install continuous underground detectable warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Section 312000 "Earth Moving."

3.12 CLEANING

- A. Clean and disinfect water-distribution piping as follows:
 - 1. Flushing: Contractor shall flush and clean all parts of completed system. All pipe and structures shall be clean and free of all construction debris, rocks, gravel, mud, sand, silt, and other foreign material, and as directed by the Engineer.

2. Disinfection: Disinfect all domestic water supply piping and appurtenances per the Oregon State Health Department requirements.
- B. Prepare reports of purging and disinfecting activities.

END OF SECTION 331415

SECTION 334200 - STORMWATER CONVEYANCE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. PVC pipe and fittings.
 - 2. Pipe outlets.

1.2 ACTION SUBMITTALS

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

1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from storm drainage system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.
- B. Profile Drawings: Show system piping in elevation. Draw profiles at horizontal scale of not less than **1 inch equals 50 feet** and vertical scale of not less than **1 inch equals 5 feet**. Indicate manholes and piping. Show types, sizes, materials, and elevations of other utilities crossing system piping.
- C. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.
- D. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic manholes, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.

- C. Handle manholes in accordance with manufacturer's written rigging instructions.
- D. Handle stormwater inlets in accordance with manufacturer's written rigging instructions.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS

- A. Basis of Design Product:
 - 1. Subject to compliance with requirements, provide the following:
 - a. Pipe and fittings to be Polyvinyl chloride plastic pipe with rubber gasket joints. Manufacturing Standard ASTM D3034 SDR 35 for pipe sizes 4"-15". If the pipe is within 5 feet of the building foundation, it shall be Schedule 40 PVC.
- B. Source Limitations: Obtain PVC pipe and fittings from single manufacturer.
- C. NSF Marking: Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-drain" for plastic storm drain and "NSF-sewer" for plastic storm sewer piping.
- D. PVC Gravity Sewer Piping:
 - 1. Pipe and Fittings: ASTM F679, SDR 35, PVC gravity sewer pipe with bell-and-spigot ends and with integral ASTM F477, elastomeric seals for gasketed joints.

2.2 PIPE OUTLETS

- A. Head Walls: Cast-in-place reinforced concrete, with apron and tapered sides.
- B. Riprap Basins: Class 50 Rip Rap.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- C. 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.
- D. Install gravity-flow, nonpressure drainage piping in accordance with the following:
 - 1. Install piping pitched down in direction of flow.
 - 2. Install piping 6" and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.
 - 3. Install PVC sewer piping in accordance with ASTM D2321 and ASTM F1668.
 - 4. Install PVC profile gravity sewer piping in accordance with ASTM D2321 and ASTM F1668.

3.3 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, nonpressure drainage piping in accordance with the following:
 - 1. Join PVC sewer piping in accordance with ASTM D2321 and ASTM D3034 for elastomeric-seal joints or ASTM D3034 for elastomeric-gasketed joints.
 - 2. Join PVC profile gravity sewer piping in accordance with ASTM D2321 for elastomeric-seal joints or ASTM F794 for gasketed joints.

3.4 STORMWATER INLET AND OUTLET INSTALLATION

- A. Construct riprap of broken stone, as indicated.
- B. Install outlets that spill onto grade where indicated.

3.5 STORMWATER DISPOSAL SYSTEM INSTALLATION

- A. Piping Systems: Excavate trenches of width and depth, and install piping system, filter fabric, and backfill, in accordance with piping manufacturer's written instructions.

3.6 IDENTIFICATION

- A. Materials and their installation are specified in Section 312000 "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
 - 1. Use detectable warning tape over piping and over edges of underground structures.

3.7 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect during installation , and again at completion of Project.
 - 1. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
 - 2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 - 3. Reinspect and repeat procedure until results are satisfactory.

END OF SECTION 334200

**Section 800
PERMIT INFORMATION**

- A. Building Permit Application: Owner or Owner's Representative shall complete the required building permit application(s) and file with authorities having jurisdiction within ten days of the date of execution of the Contract. Owner shall also pay all fees associated with obtaining such building permits.**
- B. Specialty Permit Applications: Contractor shall complete all specialty permit applications and file with authorities having jurisdiction. Owner shall pay all fees associated with specialty permits either directly to the authorities having jurisdiction or reimburse the Contractor for actual fees incurred for the specialty permit applications. Specialty Permits shall include but may not be limited to Mechanical, Plumbing, and Electrical permits.**
- C. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.**

**Section 900
DRAWINGS**

DRAWINGS DATED June 1, 2023

ATTACHED SEPARATELY

- A. List of Drawings: Drawings consist of the following Contract Drawings and other drawings of type indicated:

1. BUILDING #1: OPERATIONS FLEET MAINTENANCE BUILDING

G001	COVER SHEET
C001	GENERAL CONSTRUCTION NOTES
C100	EXISTING CONDITIONS & DEMO PLAN
C101	SITE PLAN BUILDING #1
C102	UTILITIES BUILDING #1
C103	GRADING PLAN ALTERNATE #1 AC PAVING
C104	GRADING PLAN ALTERNATE #2 NO AC
C105	SITE PLAN AND UTILITIES BUILDING #2
C500	CIVIL DETAILS
C501	CIVIL DETAILS
A101	MAIN LEVEL FLOOR PLAN
A102	MEZZANINE FLOOR PLAN
A103	REFLECTED CEILING PLAN
A104	ROOF PLAN
A201	ELEVATIONS
A202	ELEVATIONS
A301	SECTIONS
A401	RESTROOM ELEVATIONS
A501	ARCHITECTURAL DETAILS
A601	SCHEDULES
S001	STRUCTURAL NOTES
S101	FOUNDATION PLAN
S102	MEZZANINE FRAMING PLAN
S501	STRUCTURAL DETAILS

2. BUILDING #2: COBURG RURAL FIRE DEPT. STORAGE BUILDING

G001	COVER SHEET
A101	MAIN LEVEL FLOOR PLAN
A102	NOT USED
A103	REFLECTED CEILING PLAN
A104	ROOF PLAN
A201	ELEVATIONS
A202	ELEVATIONS
A301	SECTIONS
A501	ARCHITECTURAL DETAILS
A601	SCHEDULES
S001	NOT USED
S101	FOUNDATION PLAN
S102	NOT USED
S501	STRUCTURAL DETAILS